



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**COMMON CHEMICALS AS PRECURSORS OF
IMPROVISED EXPLOSIVE DEVICES: THE
CHALLENGES OF DEFEATING DOMESTIC TERRORISM**

by

James I. Rostberg

September 2005

Thesis Advisor:

Maria Rasmussen

Thesis Co-Advisor:

Robert Simeral

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE September 2005	3. REPORT TYPE AND DATES COVERED Master's Thesis	
4. TITLE AND SUBTITLE: Common Chemicals as Precursors of Improvised Explosive Devices: The Challenges of Controlling Domestic Terrorism			5. FUNDING NUMBERS	
6. AUTHOR(S) James Rostberg				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (maximum 200 words) <p>During the past decade the world has witnessed an increase in the use of Improvised Explosive Devices (IEDs). Explosives in the hands of terrorists continue to pose a significant threat. Lessons learned indicate that when traditional explosives become difficult to obtain, bomb makers turn to common chemicals as precursors to manufacture explosives. Only the imagination and the availability of certain chemicals limits the number explosives which can be manufactured with relative ease utilizing common chemicals readily available in our communities. Availability of precursor chemicals and ease by which explosives can be manufactured, increase the potential that IEDs will be deployed in the Homeland and requires a careful study of the options necessary to defeat IED deployment.</p> <p>This thesis analyzes various options, policies and procedures to ascertain which would be most appropriate to defeat explosives manufactured from common chemicals. Options include removing, restricting, and tracking certain chemicals available to the public as well as increasing awareness to emergency responders and the public. State and federal legislation pertaining to methamphetamine laboratories is analyzed to identify potential crossover legislation to counter explosives manufacture. Intelligence gathering and information sharing technologies and procedures are assessed for effectiveness as law enforcement tools.</p>				
14. SUBJECT TERMS Improvised Explosive Devices, IED, explosives, common chemical precursors, information sharing, relational database, domestic terrorism			15. NUMBER OF PAGES 91	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

**COMMON CHEMICALS AS PRECURSORS OF IMPROVISED
EXPLOSIVE DEVICES: THE CHALLENGES OF DEFEATING
DOMESTIC TERRORISM**

James I. Rostberg
Director of Homeland Security, Isanti County, Minnesota
B.A., Metropolitan State University, 2001

Submitted in partial fulfillment of the
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL
September 2005**

Author: James I. Rostberg

Approved by: Maria Rasmussen
Thesis Advisor

Robert Simeral
Co-Advisor

Dr Douglas Porch
Chairman, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

During the past decade the world has witnessed an increase in the use of Improvised Explosive Devices (IEDs). Explosives in the hands of terrorists continue to pose a significant threat. Lessons learned indicate that when traditional explosives become difficult to obtain, bomb makers turn to common chemicals as precursors to manufacture explosives. Only the imagination and the availability of certain chemicals limits the number explosives which can be manufactured with relative ease utilizing common chemicals readily available in our communities. Availability of precursor chemicals and ease by which explosives can be manufactured, increase the potential that IEDs will be deployed in the Homeland and requires a careful study of the options necessary to defeat IED deployment.

This thesis analyzes various options, policies and procedures to ascertain which would be most appropriate to defeat explosives manufactured from common chemicals. Options include removing, restricting, and tracking certain chemicals available to the public as well as increasing awareness to emergency responders and the public. State and federal legislation pertaining to methamphetamine laboratories is analyzed to identify potential crossover legislation to counter explosives manufacture. Intelligence gathering and information sharing technologies and procedures are assessed for effectiveness as law enforcement tools.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION.....	1
A.	PURPOSE.....	2
B.	IMPORTANCE.....	3
C.	SOLUTIONS	4
D.	CHAPTER BY CHAPTER SUMMARY.....	7
II.	THREAT TO HOMELAND SECURITY	9
A.	PRECURSORS	9
1.	Theory of Explosives.....	10
2.	Terrorist Incidents by Tactic	12
B.	SIGNIFICANCE OF THE PROBLEM	14
C.	TERRORISTS CAPABILITIES	18
D.	POTENTIAL SOLUTIONS.....	19
1.	Options to Defeating IED Precursor Chemicals	19
III.	LEGISLATIVE CONTROL	23
A.	STATE LEGISLATION	24
B.	DESCRIPTION OF TERMS.....	26
C.	FEDERAL LEGISLATION	26
1.	Federal Laws Requiring Point of Sale Restrictions	27
IV.	CHALLENGES OF CONTROL	29
A.	TERRORIST TRAINING.....	29
1.	Pakistani Terrorist Training Manual	29
B.	ADDITIONAL TRAINING REQUIRED.....	30
1.	Examples of bombings	31
C.	REPOSITORY OF INFORMATION	32
V.	RECOMMENDATIONS AND CONCLUSION	39
A.	AWARENESS TRAINING.....	41
B.	INFORMATION SHARING	42
1.	Link Analysis	44
C.	SUMMARY.....	52
D.	CONCLUSION	55
VI.	APPENDICES	57
A.	DEFINITIONS	57
B.	SELECTION OF VARIOUS BOMBINGS WORLDWIDE.....	59
	LIST OF REFERENCES	73
	INITIAL DISTRIBUTION LIST	75

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

Figure 1.	Example of Linked Associations	44
-----------	--------------------------------------	----

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

Table 1.	Terrorist Incidents by Tactic	12
Table 2.	Legislative Attempts to Control Precursor Chemicals.....	24

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

This thesis represents the final academic work required for the Master of Arts in Security Studies in Homeland Security and Defense. I would like to thank the staff of the Center for Homeland Defense and Security (CHDS) for their enduring efforts to take care of every challenge we brought to them. They kept us on task and were a never-ending source of information, if they did not know the answer, they would find the answer.

I wish to thank the professors of CHDS for providing a very educational program. Their scholarly background and institutional knowledge has been exceptional. It has been a privilege to be a part of such a positive and professional academic experience.

I also wish to thank my advisors, Dr Maria Rasmussen and CAPT Robert Simeral for their continuing guidance and support through the entire thesis process. Their recommendations to improve the content of this thesis are reflected throughout this academic work.

In addition I want to recognize my employer, Isanti County in Minnesota, the Isanti County Board of Commissioners and the Isanti County Coordinator for their encouragement. My participation in this program would not have been possible without their generous support.

I cannot over emphasize the importance of a supportive family during an academic program such as this one. My wife Kathy deserves much of the credit for my success in this Masters program. Her undaunted support during this eighteen month program allowed me to dedicate the time necessary to be successful in this endeavor. She took care of our home and family while I was away at the Naval Postgraduate School in Monterey, California. Now that this program has come to a close I will be able to spend more time with Kathy and the rest of our family.

Overall, this has been a very rewarding experience for me and I hope this thesis will be of benefit in defeating the deployment of IEDs within our homeland. Saving lives and property is the goal and this thesis is an attempt to help meet that goal.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

Four years after 9-11, having dedicated billions of dollars towards the war on terrorism, the question remains - is the United States better prepared to counter terrorism today than it was on September 10, 2001? Terror attacks within the borders of the United States, such as the April 19, 1995 attack on the Alfred P. Murrah Federal Building in Oklahoma City and the September 11, 2001 attacks in New York City and Washington DC, have generated a renewed interest in terrorism at all levels of government, and to a certain extent, the population at large. But have the funds invested prepared the first responders (law enforcement, fire fighters, emergency medical technicians, etc) to counter the terrorism threat? Does the purchase of new equipment and technologies better prepare first responders to meet the challenges posed by acts of terrorism? Do first responders have the necessary equipment and training needed to meet the terrorism challenge and thus protect lives and property?

The world has seen an increase in the loss of both lives and property as a result of terrorists who have demonstrated their intentions to create fear and intimidate any population they believe disagrees with their agenda. Terrorism has been around for many centuries and in many forms, such as targeted killings, bombings, poisons, toxic chemicals and biological contamination. Of these various forms of terrorism, explosives have been the most popular choice among terrorists. Explosives are typically more readily available, safer to handle, and can be used to produce an immediate effect that is both noticeable and fearful.

“According to the FBI Bomb Data Center, approximately 70% of all terrorist incidents involve the use of explosives and incendiary agents. Because of the prevalence of use, individuals need to understand explosives in order to safely respond to an explosive incident.”¹ The most prevalent form of explosive device utilized by terrorists today is the Improvised Explosive Device (IED). Improvised Explosive Devices are homemade, non-conventional explosive devices, which are used to destruct, incapacitate

¹ U.S. Department of Homeland Security, Office for Domestic Preparedness, “Explosive Devices,” *Awareness Level WMD Training* (n.d.), http://cdp.dhs.gov/pdfs/agert/Explosive_Devices.pdf [Accessed September 19, 2005], 82.

or harass. Improvised Explosive Devices can be fabricated from either military or commercial grade explosives (through theft or purchase) or from explosives that have been manufactured by combining common chemicals. It is the later of these two methods, the use of common chemicals as precursors to IEDs, which this thesis addresses.

A. PURPOSE

The purpose of this thesis is to examine various approaches which may defeat the use of common chemicals from being used as precursors for explosives in IEDs. The thesis considers the effectiveness of each approach in order to assist policy makers in determining which approach or combination of approaches should provide the best results. Approaches analyzed include removal of certain products from the market place, restricting and/or tracking the sale of certain products, providing explosives awareness training for first responders, and increased intelligence gathering/information sharing technologies for law enforcement.

To ascertain the effectiveness of passing legislation in order to remove, restrict or track the sale of products that can be used as precursor chemicals, the thesis examines legislative attempts to defeat methamphetamine production. During the 2005 legislative session state and federal laws were introduced to control the sale of certain precursor chemicals used in methamphetamine production. Should any of these laws prove to be successful in defeating methamphetamine production, similar legislation could be passed to control the sale of precursor chemicals used in explosives production. The thesis reviews certain laws designed to defeat methamphetamines in order to identify types of legislation necessary to defeat explosive manufacture.

Methamphetamine legislation is considered a reasonable guide in determining legislative effectiveness of controlling precursor chemicals as the manufacturing process for methamphetamines so closely mirrors that of explosives. These two products, methamphetamines and explosives are processed in much the same manner and both are very dangerous during and after manufacture. Both the manufacture of IEDs and the manufacture of methamphetamines have the following characteristics:

1. each are manufactured in clandestine labs;

2. each are manufactured utilizing common chemicals readily available in the community;
3. each causes an environmental and public health threat;
4. each poses a health and life safety threat to those in the lab and;
5. each is a threat to those who come into contact with it.

The comparisons provided only demonstrate the similarities of the manufacturing process of these two products and the potential for controlling precursor chemicals. The purpose of this thesis is not to address the manufacture of methamphetamines, but rather the manufacture of explosives. More specifically, although any explosive can be used to assemble an IED, the purpose of this thesis is to examine the threat of manufacturing explosives utilizing common household products that contain precursor chemicals which, when combined, become explosive.

B. IMPORTANCE

Improvised Explosive Devices (IEDs) are homemade explosive devices fabricated in an improvised manner incorporating chemicals used to destruct, incapacitate or harass and are a threat to first responders and citizens of the United States. The use of IEDs is increasing world wide and it is no longer a matter of 'if' they will be deployed within the United States, but rather 'when.' Although IED usage within the United States has been limited to smaller attacks, the bombing of the Alfred P. Murrah Federal Building in Oklahoma City in 1995 demonstrated the potential destructive power of an IED. Timothy McVeigh used ammonium nitrate (which is used as a fertilizer and is available from agricultural supply stores) and fuel oil (when combined with ammonium nitrate is known as ANFO) to destroy the federal building. Could this disaster have been prevented? What, if anything, can be done to prevent another disaster, whether on a large or small scale? Would it not be more prudent to take a proactive approach to this potential problem and identify possible solutions, rather than wait and end up responding to an incident only to wonder if something could have been done to prevent it?

In an attempt to avert the misuse of certain products from being manufactured into explosives, manufacturers are attempting to form products that are useful for the purpose intended, yet inert as a precursor of an IED. Such is the case with ammonium

nitrate fertilizer (a dual use product). A review of incidents in Great Britain and the U.S. indicates that it has also been used in some of the largest bombings worldwide.² However, even coating the prills to reduce its absorbency of fuel oil, there are still ways to thwart the preventative measure by pulverizing the prills as described in Chapter II-B.

In some cases fertilizer manufacturers have been working with federal agencies (specifically the ATF) to add taggants into their products to enable the product to be traced back to the manufacturer in case the product was used as an explosive. The concern here is that although the taggants would be useful in solving a case, it is not effective in preventing the product from being used as an explosive; the damage would already have been done. Although taggants would certainly assist in the investigation of an explosion and tracking down the perpetrator, two important factors do not seem to be considered in the ATF approach: 1) if the perpetrator is a suicide bomber there may not be anyone to search for, and 2) ATF is working with larger bulk chemicals but do not appear to be addressing the smaller bulk precursor chemicals so readily available in our communities.

There are no guarantees that the recommendations from this thesis will prevent the use of IEDs within the United States. There are too many opportunities for those who wish to cause fear and create terror to prevent all IEDs from being used. However, the recommendations found in this thesis, if implemented, should reduce or defeat IED incidents. For a selection of bombings worldwide during the past thirteen years see Appendix B.³

C. SOLUTIONS

Denying terrorists access to explosives is the first step in a proactive attempt to defeat IED incidents which may require employing multiple approaches as identified in Chapter II-D. Implementing restrictions and increasing controls on existing commercial explosives may be an effective means to reduce the incidence of terrorists acquiring explosives. However, as commercial and military explosives become more difficult to obtain, terrorists will turn to making their own explosives as has been evidenced with the

² U.S. Department of the Treasury, *Progress Report, Study of Marking, Rendering Inert, and Licensing of Explosives Materials* (Washington, D.C.: U.S. Department of the Treasury, 1997), 26.

³ See Appendix B.

Irish Republican Army (IRA) in Ireland, Mujahideen in Afghanistan, and Islamic Resistance Movement (Hamas) in the Gaza Strip and West Bank. The necessary materials and instructions to make explosives can be found in every community. Hardware and paint stores, fuel stations and gardening shops, are a small example of the retailers that carry the necessary chemicals for manufacturing explosives. Instructions for explosives manufacture are available on the internet providing easy access to materials lists, processes, and procedures for making explosives.

Denying potential terrorists access to retail stores that sell products that may be used as precursors to manufacture explosives, and limiting access to instructions on the internet would prove virtually impossible. Removing certain products from the marketplace causes undue burdens upon both the retail industry as well as the consumer.

Restricting or limiting access to certain precursor products to date has proven to be a difficult task. The public doesn't particularly appreciate the inconvenience of obtaining a prescription to purchase a cold remedy which previously was available over-the-counter. Restrictions of this type require legislation by the individual states as well as Congress. Convincing legislators of the need to restrict certain products has been and continues to be a challenge as can be seen in Chapter III-A. Prior to the 2005 legislative session twenty-seven states did not have existing laws restricting the point of sale of the precursor chemicals ephedrine and pseudo ephedrine, both of which are used in cold remedies as well as being used as a precursor in the manufacture of methamphetamine. During the 2005 legislative session forty-five states either amended existing, or adopted new, restrictive point of sale laws to limit access to ephedrine and pseudo ephedrine. Of the forty-five states, twenty-nine states passed legislation during the 2005 legislative session to restrict the point of sale of these precursor chemicals.

Restricting and/or limiting access to precursor chemicals are not the only methods to control these products. Another method of control is to track the sale of certain products by requiring the purchaser to register at the time of purchase. During the 2005 legislative session eleven states introduced legislation requiring purchasers of products containing ephedrine or pseudo ephedrine to register at the time of purchase. Ten states passed that legislation.

The purpose in following state and federal ephedrine and pseudo ephedrine laws are due to the similarities between manufacturing methamphetamines and manufacturing explosives. First, each of these products require certain chemicals used as precursors in the manufacturing process. Secondly, although these precursor chemicals are legal to purchase and possess, when combined with other chemicals become illegal products which can carry severe legal penalties. Third, each of the processes identified above require a basic knowledge of chemistry and instructions to successfully manufacture the product. Due to the internet, access to this knowledge is readily available to anyone seeking the information. Fourth, anyone with the means to manufacture methamphetamines can also manufacture explosives which can then be used to make IEDs. Currently in Iraq, IEDs are being formed from unexploded military ordnance which decreases the need to manufacture explosives. However, as with the IRA, when availability to obtain commercial or military grade explosives becomes difficult, bomb makers will turn to manufacturing their own explosives utilizing certain common chemicals as precursors.

Separating bomb makers from explosives is a difficult but necessary requirement to defeat IEDs. The question is: will limiting certain chemicals from the public reduce the potential of bomb makers obtaining explosives? The United States, although experiencing theft of commercial grade explosives, does have a relatively good process of controlling explosives. Due to the decreased availability of military and commercial grade explosives in the United States (as compared to Iraq for instance), it is more likely that bomb makers will turn to manufacturing their own, crude explosives. See Chapter II-B for precursor chemicals currently available in the community, which can be used to manufacture IEDs as well as the significance of the problem.

Other potential solutions for defeating IEDs include providing awareness training for first responders and a robust information sharing platform for law enforcement. Awareness training for first responders would include how to recognize, and what to do if they discover, a clandestine bomb making lab. Currently first responders receive explosives awareness training but the training lacks the information necessary for first responders to make an informed decision when encountering a potential clandestine lab. This lack of apparent need for awareness training is most likely due to the limited number

of IEDs that have been recognized within the United States. McVeigh had the only well documented use of an IED. Although not a manufactured explosive, but certainly an IED, were the planes that were used as aerial-borne improvised explosive devices (ABIEDs) on September 11, 2001.

Providing an increased level of explosives awareness training to first responders, coupled with a community awareness campaign, is possible and can be very effective. In addition to the approach taken, increasing law enforcement's ability to gather, analyze and share pertinent information with other law enforcement agents, through shared relational databases, provides an effective tool in the effort to defeat IEDs. Awareness training for emergency responders, awareness campaigns for the community, and improved information sharing for law enforcement provides an effective response.

D. CHAPTER BY CHAPTER SUMMARY

Chapter I addresses the issue of Improvised Explosive Devices manufactured with common chemicals used as precursors. The Chapter examines the various potential approaches which may prevent or limit this use of precursors. The importance of finding a solution is addressed and identified. This chapter also provides a chapter by chapter summary of the thesis and defines terms used.

Chapter II expands on the specific IED threat to homeland security, addresses the current threat throughout the world and the potential for an increase in IED deployment within the United States. This chapter also defines precursors, provides a summary of their past use, discusses various approaches to their defeat, the significance of the problem, and identifies terrorist capabilities.

Chapter III discusses the challenges of controlling the terrorist use of precursor chemicals due to terrorist explosives training and the ready availability of materials and instructions. This chapter also addresses the need to provide increased explosives awareness training to emergency responders to include precursor chemicals used in bomb making and proper response tactics.

Chapter IV examines the potential for passing effective legislation to defeat IED manufacture by examining current legislation passed to defeat methamphetamine manufacture. The common links between bomb making and methamphetamines is in the

chemicals and process used in the manufacture of each. By examining legislative success to defeat methamphetamine labs, an extrapolation can be made towards potentially successful legislation to defeat bomb making labs.

Chapter V offers recommendations, based upon the research, to defeat IED deployment within the homeland prior to it becoming a larger problem. Early intervention, such as improved awareness training and information sharing technologies, suggest opportunities to significantly reduce the successful deployment of IEDs.

Chapter V also concludes the thesis with lessons learned from previous chapters and restates the significance of reducing the terrorist threat of deploying IEDs within the homeland.

Chapter VI includes two appendices, the first lists definitions of terms used throughout this thesis while the second appendices lists a chronology of bombings worldwide spanning the period 1961 thru 2003. threat to homeland security

II. THREAT TO HOMELAND SECURITY

When Timothy McVeigh decided to cause damage to the Murrah Federal building in Oklahoma City, he turned to an explosive that has experienced years of legitimate and useful purposes. The explosive is called ANFO as it is comprised of ammonium nitrate and fuel oil. ANFO has been used extensively in the United States by farmers for clearing tree stumps to convert wooded land into tillable land. Both ammonium nitrate and fuel oil are common chemicals which are in regular use around the world. Ammonium nitrate is a very common form of fertilizer and used extensively in agriculture. Fuel oil is used as both a heating source and a fuel in farm tractors.

When members of al-Qeada decided to cause damage to the World Trade Center, the Pentagon, and other targeted buildings, they used domestic fuel as the explosive and domestic aircraft as the missile. There is a large abundance of aviation jet fuel within the United States in which to wreck havoc and cause damage many times greater than the attacks of September 11, 2001. Aviation jet fuel, although known to many as an explosive, was not typically perceived as such by the traveling public. If the public considered aviation jet fuel an explosive, would well meaning parents load their children onto large flying bombs, and send them across the country to visit relatives? The answer is that due to the level of safety achieved over the years by the aviation industry, flying is quite safe. Clearly, if jet fuel is handled properly with accepted safety protocols, the fuel is used as a purposeful tool rather than a weapon.

When used properly, and within its defined scope or purpose, ammonium nitrate, fuel oil, and aviation jet fuel are safe products that the public has become very comfortable with and accepting into their daily lives. When used for illegitimate purposes, these same common chemicals can become precursors for explosives (as described above) and threaten the safety of our homeland.

A. PRECURSORS

Precursor chemicals come in many forms and have a wide variety of uses. They are generally legal to purchase, store and use. They include any chemical compound or

element that can be converted to an explosive compound through a chemical reaction or series of reactions. Many precursor chemicals are used in our everyday lives and include such chemicals as acetone, ammonia, benzene, butane, ether, ethylene glycol, glycerin, iodine, lead, mercury, methane, nitric acid, perchloric acid, peroxide, silver, sulfuric acid, toluene, and urea. Precursor chemicals are found in retail stores or around the home. Explosives derived from common chemicals create both a hazard and a threat to the community. These types of explosives are relatively easy to manufacture and difficult to detect. Moreover, the anonymity of the bomb maker is often maintained due to the lack of control over the precursor chemicals so commonly available in the community.

The most recognized IED attacks in the United States are the ANFO (ammonium nitrate and fuel oil) bomb that destroyed the Murrah Federal Building in Oklahoma City and the four hijacked commercial airliners used as bombs in the 9-11 attacks in Pennsylvania, New York City, and Washington, DC. Other than these two terrorist events, the use of IEDs in the United States has not been an issue of great concern, at least not at the level that it is in other parts of the world. The United States has not yet experienced a suicide bomber walking into a shopping mall and detonating a bomb, killing dozens of people. However, the threat does exist and the fact that an unknown number of terrorists worldwide have been trained in the process of manufacturing explosives from commonly available chemicals heightens the threat. Terrorist training manuals have been found, retrieved and translated by intelligence forces and the detail by which explosives manufacture is explained in these manuals is cause for concern. The basics of explosives manufacture is not complicated and can readily be learned by the novice.

“Improvised explosives, such as military and commercial explosives, are typically mixtures of an oxidizer and a fuel.”⁴ The basic theory of making explosives is explained quite succinctly in the following quote which was extracted directly from a translated Mujahideen Explosives Handbook:

1. Theory of Explosives

2.8 The theory of Mixes

A good mixture must contain 2 main substances. The first must be rich in Oxygen and the second must be able to

⁴ “Explosive Devices,” 86.

react very fast so that it changes and multiplies its volume. This is what we call explosives.

2.8.1 Good producers of Oxygen (O)

1. Potassium Chlorate (KClO_3).
2. Potassium Nitrate (KNO_3).
3. Ammonium Nitrate ($\text{N}_2\text{H}_4\text{O}_3$).
4. Potassium Permanganate (KMnO_4).
5. Sodium Chlorate (NaClO_3).

2.8.2 Makers of good reaction with Oxygen (O)

1. Aluminum (Al) powder.
2. Magnesium (Mg) powder.
3. Mixture of Carbon (C) and Sulphur (S).
4. Mixture of Carbon (C) and Sugar.
5. Mixture of Carbon (C) and Wood.
6. Mixture of Flour and Starch.⁵

Note that one of the identified items listed above (2.8.1.3), is ammonium nitrate. It has already been determined that ammonium nitrate is a main ingredient in explosives. The reason it is used is due to its high concentration of oxygen (three parts oxygen as described in its chemical formula). The reason potassium chlorate, potassium nitrate, and sodium chlorate (all contain three parts oxygen in their chemical make-up) are not mentioned as often as a precursor chemical for explosives is due to their more limited quantity and availability. Ammonium nitrate is much easier to obtain due to its primary purpose as a fertilizer. However, each of these chemicals can be produced by other means which is covered later in this chapter.

Utilizing the table above, anyone with a basic chemistry background will recognize that combining the chemicals Carbon (charcoal), Sulfur, and Potassium Nitrate (Saltpeter) produces the explosive known as gunpowder, one of the oldest explosives known to mankind. Webster's Ninth New Collegiate Dictionary describes gunpowder as "an explosive mixture of potassium nitrate, charcoal, and sulfur used in gunnery and blasting." In fact it is very easy to find the ingredients of many explosives by doing a quick search of a community library or the internet. Terrorist organizations capitalize on the ease by which this information can be obtained as well as the manufacture of explosives. This is demonstrated by reviewing the instruction manuals terrorists use to

⁵ Abdel-Aziz, *The Mujahideen Explosives Handbook* (For the Preparation of the Mujahideen, February 7, 1996), 6, http://www.exet.nu/html/download/ovrigt/mujahideen_explosive_book.pdf [Accessed September 20, 2005].

train their operatives. The various recovered terrorist training manuals describe in great detail the process by which operatives can convert common chemicals into explosives. In addition, their instruction manuals demonstrate the ease by which explosives can be manufactured by the average person with a limited knowledge of chemistry. Utilizing the table listed above, a large number of explosives can be manufactured by varying the combination of the chemicals.

Explosives are by far the most prevalent tactic of terrorists. The table below lists the terrorist incidents by tactic for the period of January 1, 1968 to April 9, 2005. Explosives accounted for 53.8% of the incidents, 76.7% of the injuries, and 49.7% of the fatalities during this period of time. Additionally, explosives used in IEDs account for the majority of deaths in the current conflict in Iraq.

2. Terrorist Incidents by Tactic

Range: 01/01/1968 – 04/09/2005⁶

Tactic	Incidents	Injuries	Fatalities
Armed Attack	3483	10290	5370
Arson	839	296	367
Assassination	2160	951	2740
Barricade/Hostage	200	2198	846
Bombing	12883	58307	14653
Hijacking	233	376	482
Kidnapping	1629	115	669
Other	143	382	226
Unconventional Attack	55	103	3004
Unknown	236	196	268
TOTAL	21861	73214	28625

Table 1. Terrorist Incidents by Tactic

While terrorists have yet to bring their tactics to the Homeland, there is reason to be concerned that they will. The September 11, 2001 terrorist attack on the United States

⁶ National Memorial Institute for the Prevention of Terrorism, "Terrorist Incident Reports, Incidents by Tactic," *MIPT Terrorism Knowledge Database*, www.tkb.org/IncidentTacticModule.jsp [Accessed August 25, 2005].

is but an example of the destruction terrorists can inflict upon a society, especially one as open as the United States. As of the date of this report, the United States has not yet experienced the frequent terrorist attacks that are being experienced in Iraq or Israel. Emergency Responders in the United States have a limited experience in dealing with suicide bombers, IEDs, and Vehicle Borne Improvised Explosive Devices (VBIEDs), also known as car and truck bombs. Precursor chemicals are easy to access and are readily available in any town. An example of the ease by which terrorists can obtain precursor chemicals is described in the following excerpt taken from a Pakistani Terrorist Training Manual:

This is the kind of course that teaches us how to make deadly explosives and lethal poisons from easily available substances anywhere on the market or anywhere across the globe⁷

An informed public can have a powerful impact on defeating IEDs while an uninformed public can actually empower the terrorist. The concern may be public apathy. First, the possibility of a terrorist attack within the borders of the Homeland appears remote, and the longer the period of time that passes since the last attack, the less threatening new attacks appear. There appears to be a directly proportional relationship between the time that has passed since the last attack and the public's perception of the possibility of a new attack. Secondly, this public perception is supported when federal agencies react to a terrorist attack in another part of the world. Such was the case when suicide bombers in London detonated explosives on three trains and a bus in July 2005. The United States responded by increasing protective procedures on the rail system within the homeland as though that was the most likely infrastructure to be attacked. However, no information was provided to the public to indicate that terrorists were more likely to target the US rail system following the London bombings than prior to the London bombings. Whatever the purpose of the increased protective procedures, whether to dissuade terrorists from attacking the rail system (urging terrorists to focus on other infrastructures) or to provide a "feeling of safety" for the traveling public to prevent an economic burden on the rail system through decreased rider ship, it does little to help the public assess true terrorist threats.

⁷ Massoud Ansari, "JTIC Exclusive: A Bomber's A-Z - Notes From Pakistani Terrorist Training Manuals," Jane's Terrorism and Insurgency Centre (16 June 2004).

There are not enough resources available to provide full protection of every infrastructure from the effects of IEDs. The answer is to utilize and deploy existing resources as prudently as possible. If the target cannot be predicted with accuracy, then one solution is to defeat IEDs prior to their being deployed. To defeat IED deployment by terrorists, this thesis examines various options to counter the threat. Options considered include:

1. No change
2. Removal of products or restricting their sale to the public
3. Tracking the sale of products containing precursor chemicals
4. Providing awareness training for first responders
5. Information sharing between first responders pertaining to safety issues
6. Providing public awareness campaign on the dangers of certain products

A more in-depth description of these options will be discussed in chapters III and V.

B. SIGNIFICANCE OF THE PROBLEM

The problem is how to keep legal, legitimate, useful chemicals and products from being employed as precursors to explosives and ultimately deployed as an Improvised Explosive Device (IED). Explosives used by terrorists can be manufactured from common products found in retail stores in any town in the United States, or as the Pakistani Terrorist Training Manual states, "...from easily available substances anywhere on the market or anywhere across the globe." One of the more common explosives is triacetone triperoxide (TATP) which can be manufactured by combining acetone (fingernail polish remover), hydrogen peroxide (hair dye), and sulfuric acid (drain cleaner).

The availability of each of these products is an example of the significance of the problem. Acetone can be found in numerous products or bought by the gallon at many retail stores. Hydrogen peroxide can be purchased openly at lower concentration (household hydrogen peroxide is around 3 percent so it takes ten times as much to obtain a 30 percent solution). The final chemical, sulfuric acid can also be obtained in retail stores or be manufactured from other chemicals.

In the 1950s ammonium nitrate (AN) became a common explosive. Ammonium nitrate, when combined with fuel oil (FO), becomes the explosive known as ammonium nitrate fuel oil (ANFO). It was a truckload of this explosive that Timothy McVeigh used to destroy the Murrah Federal Building in Oklahoma City in 1995. Although McVeigh used aviation fuel rather than fuel oil, the manufacturing process was the same. ANFO is well known to makers of home-brewed explosives as it is much cheaper and less sensitive than dynamite. However, due to governmental controls on commercial fertilizers, a treatment has been added to the ammonium nitrate to make it more difficult to make explosives. Manufacturers of ammonium nitrate have agreed to apply a coating to the pellets (prills) of AN to make a product that will continue to work as a fertilizer yet less soluble of fuel oil (or other fuels) and thereby inert as an explosive. However, the industry has yet to be successful as the pellets can be pulverized. To pulverize and prepare the hardened prills of the fertilizer, bomb makers may use the following items:

- Commercial coffee grinders are very effective for the process of grinding.
- Grist Mills for the crushing of barley or wheat are also effective.
- Odd job mixers or even a concrete mixer would be suitable for the mixing of the ammonium nitrate and the liquid fuel.⁸

The process and procedure will not be described in this thesis.

Terrorists turn to common chemicals for the manufacture of explosives when access to military or commercial grade explosives is difficult to obtain. The following are examples of the types of explosives terrorists manufacture.

Urea Nitrate

Urea nitrate is also considered a type of fertilizer-based explosive, although, in this case, the two constituents are nitric acid (one of the ten most produced chemicals in the world) and urea. A common source of urea is the prill used for de-icing sidewalks. Urea can also be derived from concentrated urine. This is a common variation used by terrorists in South America and the Middle East. Often, sulfuric acid is added to assist

⁸ "Explosive Devices," 87.

with catalyzing the constituents. A bucket containing the urea is used surrounded by an ice bath. The ice serves in assisting with the chemical conversion when the nitric acid is added. The resulting explosive can be blasting cap sensitive. Urea nitrate has a destructive power similar to ammonium nitrate.⁹

Potassium Chlorate

A plastic explosive, such as potassium chlorate, is an extremely volatile explosive compound which has been used as the main explosive filler in grenades, land mines, and mortar rounds. Using a simple process, potassium chlorate can be extracted from common household bleach by adding potassium chloride (sold as a salt substitute at health and nutrition stores). An even easier process of making potassium chlorate is by properly mixing solidox (used in welding applications as an oxidizing agent) and sugar or glucose. “This explosive has approximately 83% of the explosive power of TNT. Potassium chlorate is a common ingredient in some fireworks and can be purchased in bulk from fireworks/chemical supply houses. Potassium chlorate normally appears in white crystal or powder form.”¹⁰

Powdered Ammonium Nitrate and Aluminum Powder

Ammonium nitrate can be procured in powdered form - one example is a common cold pack. These use either ammonium nitrate in prill or powder. If ammonium nitrate is in prill form such as in fertilizer, it is a simple task to grind it into a powder as described above. The aluminum powder can be procured at a professional paint store, or simply filed from an ingot. The explosive has 75% the power of TNT and is sensitive to friction, impact, or electrostatic discharge (ESD). It requires only a blasting cap for initiation.¹¹

This mixture of readily available chemicals has been used in very large IEDs. In 1997, the equivalent of 500 pounds of TNT of ammonium nitrate damaged three

⁹ Ibid., 88.

¹⁰ Ibid., 86.

¹¹ Ibid., 87.

apartment complex bombings in Moscow. The devastating effects from each of those devices resulted in over 100 casualties per incident.¹²

Mercury Fulminate

Mercury fulminate is a heat or shock sensitive explosive that is made from mercury (found in mercury switches or thermometers), nitric acid, ethyl alcohol, and distilled water. It was introduced as effective filler for percussion caps. It is not used today for that purpose because of more stable explosives from modern chemistry taking its place, but its high power, ease of manufacture, and relative stability (as compared with some other improvised primer choices) makes it an attractive choice for improvised blasting caps.¹³

Peroxide –Based IED

Peroxide-based improvised explosives are an emerging threat domestically. However, these IED have been a common explosive used by international terrorists for some time. Hexamethylenetrinitriperoxidediamine (HMTD) and Triacetone triperoxide (TATP) were initially developed 100 year ago. They are both extremely sensitive and are used as an explosive by terrorists/bombers as both an initiator (blasting cap) and as a main charge. TATP is commonly found as the main charge being employed by Middle East terrorists in suicide bombings.¹⁴

HMTD has between 60-116% of the power of TNT, and is comprised of peroxide (ideally 30% or above), citric acid, and hexamine (heat tabs). TATP has 88% of the power of TNT and is comprised of peroxide, acetone, and sulfuric (battery) acid.¹⁵

Few options exist for defeating their use as an explosive precursor. In the example of TATP, described above, removing or controlling the sale of fingernail polish remover, hair dye, or drain cleaner, the combination of which forms TATP, would not be a popular choice with those who use these products. Manufacturers may be able to derive

¹² Ibid.

¹³ Sam Barros, "Fulminate Explosives Synthesis," <http://www.powerlabs.org/chemlabs/fulminate.htm> [Accessed September 15, 2005].

¹⁴ "Explosive Devices," 87.

¹⁵ Ibid.

new products that would accomplish the same results but that does not mean that the new product would not contain the same chemicals that are currently a potential problem.

The below listed concerns are a small sample of the problems of dealing with precursor chemicals. Addressing these and other issues create a monumental challenge in defeating IED manufacture. Without identifying solutions to these concerns terrorists will maintain the advantage. The terrorist threat is real and their capabilities are proven.

A synopsis of the problem is as follows:

- Ammonium nitrate (AN) is the most readily accessible common chemical with the potential for use in explosive devices, and research to date has not yielded an effective means of rendering AN inert.
- Bomb making information is readily accessible from a variety of legitimate sources.
- Availability of information on how to make improvised explosive devices is compounded by the ease with which anyone can also obtain the necessary materials to make a bomb.
- Improvised explosive devices can be manufactured from such common chemicals as acetone, peroxide, and any of numerous acids.
- Triacetone Triperoxide (TATP), a combination of these ingredients, is currently the most common explosive used by terrorists in Israel and was also used by Richard Reid, the shoe bomber.
- Another peroxide-type explosive is hexamethylenetriperoxidediamine (HMTD), which is less sensitive than TATP but still dangerous.
- Dual use products are sold for legitimate purposes yet can also be used illegally.
- Tracking product sales is not a common practice.
- Improvised Explosive Devices used internationally will ultimately and inevitably be used domestically.

C. TERRORISTS CAPABILITIES

Terrorists have proven themselves effective at causing fear and panic within the populace by attacking those most unprepared. Methods used by terrorists vary from armed attack, arson, assassination, hostage taking, bombing, hijacking, kidnapping, and weapons of mass destruction. Although terrorist attacks involving nuclear, biological, or chemical weapons (typically known as WMD) continue to be debated as to which poses a greater threat to the homeland, conventional explosives are more likely to be used. According to a CRS Report for Congress, Weapons of Mass Destruction – The Terrorist

Threat, “The Central Intelligence Agency believes that it is likely that terrorists will continue to choose conventional explosives over WMD.”¹⁶ This rationale is due to the difficulty of producing or obtaining weapons of mass destruction coupled with the fear that its usage would undermine support for the terrorists’ cause.

D. POTENTIAL SOLUTIONS

Various options exist to defeat IEDs and are addressed here as potential solutions. A review of each option is performed with their positives and negatives identified. Further in-depth evaluations of selected options are found in Chapters III, IV and V.

1. Options to Defeating IED Precursor Chemicals

1. No change

This option would mean that no attempt is made at controlling the manufacturing of IEDs. This option may be acceptable provided IED usage does not increase in the United States. However, in case IED usage becomes more prevalent it seems prudent to be proactive rather than reactive.

2. Removal / Point of sale restriction

There is an economic impact to both manufacturers and retailers when removing products from the market. This option also does not take into account the products that are already in the hands of the consumer. In addition, removal of certain products from the market sends the message to the consumer that the government does not trust them. Removing fingernail polish remover, hair bleach, and drain cleaner from the shelves of stores, in an attempt to keep bomb makers from manufacturing TATP, would not be an ideal situation for the consumer.

Restricting the sale of certain products would also have a financial impact on retailers when they are required to regulate the sale of certain products. In these cases the increased costs of regulation, depending on how many products are regulated, may be passed onto the consumer. Chapter IV compares the legislation adopted by each of the 50 states and the District of Columbia during the 2005 legislative session.

¹⁶ Steve Bowman and Helit Barel, *Weapons of Mass Destruction – the Terrorist Threat*, CRS Report for Congress (December 8, 1999), 1.

3. Tracking

In the event that future legislation requires retailers to report to law enforcement authorities the sales of certain products purchased the opportunity to track precursor products would be available. Although tracking the sale of certain products can be an effective investigative tool, the reporting of product sales would need to be consistent among retailers. The only way to ensure that retailers would report the sales of these items would be to pass legislation making retailers mandated reporters. This approach has two concerns, financial impact on retailers and perceived civil liberty violations on consumers.

There would be a financial cost to the retailer with the increased responsibility of being a mandated reporter. There would also be the concern on the part of the consumer that their civil liberties would be violated if they were reported to law enforcement authorities just because they purchased certain products. Legislators are sensitive to the concerns of their constituents and are constantly aware of the need to balance the good of the few with the good of the many. Concerns of increased costs to retailers or consumers coupled with perceived civil liberty violations may cause law makers to analyze this type of legislation very carefully.

4. Awareness Training

Training first responders in what to look for when entering homes or while traveling through their communities can be an effective means of locating explosive precursors. Oftentimes first responders are the first to come into contact with explosives, either inadvertently or by being targeted by a terrorist. Currently law enforcement and firefighters have received only limited training on explosives. Most first responders are unfamiliar with what to look for in the way of precursor chemicals of IEDs when doing investigations, entering buildings, or making traffic stops. In addition, Emergency Medical Technicians (EMTs) would also need awareness training as they may be the first and only team to enter a premise and thus would then be the only witness to a potential clandestine bomb lab. In providing awareness training, first responders would be better aware of their surroundings when they enter a building or a room. It is necessary that additional training in explosives awareness training include the chemicals and supplies

that are used in manufacturing IEDs to increase the first responder's ability to recognize these materials. Should the first responder recognize materials used for bomb making they would inform law enforcement after they have departed the premise. Law enforcement authorities would then decide whether a follow up investigation would be necessary.

Although there are similarities between methamphetamines and IEDs, there are some significant differences. While it is illegal to manufacture, use or sell methamphetamines, as well as to possess the products and equipment in which to manufacture it, it is legal to possess many of the components necessary to manufacture explosives. It is therefore necessary for law enforcement agencies to share information with each other in order to determine whether the person with the precursor products pose a terrorist threat.

5. Information Sharing

In order to increase the first responders' ability to recognize potential bomb making facilities, as well as other terrorist threats, a fifth option would be to increase the intelligence/information sharing between the first responder and law enforcement agencies. However, issues of information sharing between law enforcement agencies at the local, state and federal level must be addressed first. Currently, information flows from the local level to state and federal agencies, yet the information flow is not always reciprocated by these agencies back to the local level. This is a significant concern as local law enforcement agencies, especially smaller agencies, lack the information sharing architecture to share information between neighboring agencies. An information sharing architecture would provide the ability for first responders, who are both collectors and consumers of intelligence, to share important and timely information with neighboring agencies which is a powerful tool in countering terrorism.

6. Awareness Campaign

This option could be included with option 4. An awareness campaign directed towards retailers and the general public may be beneficial in the early apprehension of terrorists. By increasing the public's awareness of IEDs the chance of terrorist

successfully using explosives may be reduced. The concern here is that citizens may become hyper-alert and report false findings.

III. LEGISLATIVE CONTROL

To ascertain which policies would be most appropriate for limiting the usage of common chemicals to the purposes for which they were designed, a study was done of various state legislatures in regards to their control of methamphetamines. Methamphetamines are drugs which are manufactured from common chemicals. The possession of certain chemicals themselves is not illegal but, once manufactured into the drug methamphetamine, the possession and/or distribution of the drug becomes a felony. The success (or lack thereof) of the various state legislatures to control common chemicals used to make methamphetamines can be used to predict which policies could be effective in preventing the manufacture of improvised explosive devices.

This chapter identifies the legislation that was passed in each of the fifty states and the District of Columbia in 2005. No two states had the same approach to defeating methamphetamine production, however most states passed laws that fall into one or more of the six options identified in chapter II-D. Of the states that passed precursor legislation this year, those laws have recently gone into effect. Since the legislation passed in these states has recently become law there is no way at this time to know which law(s) will be most effective in defeating methamphetamine drug production. In one year an evaluation of the level of methamphetamine production in each state will be compared to the type of legislation that was passed in 2005 for that state. By comparing the level of methamphetamine production in each state with the type of legislation passed this year the effectiveness of that particular law can be determined.

In the case where no legislation occurred at all, such as removing a product from the market, it can be interpreted to mean that there isn't legislative support for doing so. None of the various state legislatures introduced bills during the 2005 legislative session that would have removed ephedrine or pseudo ephedrine from the market. It would seem just as unlikely that a legislature would introduce legislation removing acetone or other common household products from the market. Consumer convenience is a powerful lobbying factor and law makers are sensitive to the concerns of their constituents.

A. STATE LEGISLATION

The various legislatures of the 50 states and the District of Columbia have addressed the issue of curtailing the distribution of ephedrine and pseudo ephedrine through the implementation, or lack thereof, of legislation. The various approaches of the states will result in varying degrees of success which will be identified at a later date. The importance of the graph in table 2 is that it reflects the relative importance each state places on regulating precursor chemicals, specifically the attempt to defeat methamphetamine drug production by passing laws pertaining to the distribution of ephedrine and pseudo ephedrine. Ephedrine and pseudo ephedrine are precursor chemicals used in the manufacturing process of methamphetamine. Many states have laws or regulations that place restrictions on ephedrine at the point at which it is sold. Certain states require registering and reporting the sales of these precursors. The results of various state legislative actions are depicted in table 2.

Prior to 2005 twenty-four states had some type of law restricting the sale of ephedrine or pseudo ephedrine. During the 2005 legislative session 45 states introduced legislation to either amend existing or adopt new laws to regulate these chemicals. Of the 45 states that introduced legislation to address the issue 29 states actually passed the legislation (bringing the total number of states restricting these precursors to 37). Eleven states included language in their legislation requiring consumers to register at the time of purchase, ten states passed the legislation.

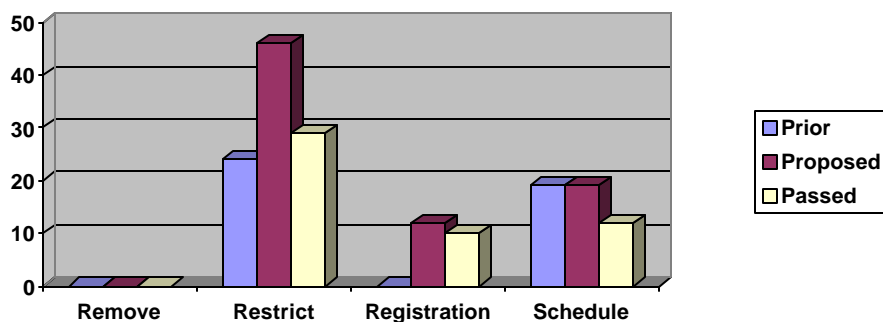


Table 2. Legislative Attempts to Control Precursor Chemicals

While nineteen states had laws controlling these precursors by listing them as scheduled drugs, 19 states introduced language to either amend existing or adopt new scheduling laws. Of the 19 legislatures proposing new or amended language 11 were successful in passing the legislation (bringing the total number of states scheduling these precursors to 23). Interestingly, no legislature has introduced language to remove these products from retailer's shelves which indicates that legislators are not likely to remove useful products from the market in order to prevent the product from being misused.

In regards to the graph in table 2 the terms Prior, Proposed, and Passed represent the following:

1. Prior represents the number of states that had methamphetamine precursor laws in effect prior to the 2005 legislative session;
2. Proposed represents legislation proposed during the 2005 legislative session that addressed methamphetamine precursors (indicates intent on the part of the legislature to regulate precursor chemicals); and
3. Passed represents legislation passed during the 2005 legislative session that addressed methamphetamine precursors (indicates commitment on the part of the legislature).

The terms Remove, Restrict, Registration, and Schedule represent the following:

1. Remove represents laws which require the removal of certain precursor chemicals (in this case ephedrine and pseudo ephedrine);
2. Restrict represents restricting certain precursors at the point of sale. This can include moving the precursor behind a counter, requiring a pharmacist or assistant to distribute the precursor, or limit the quantity of the precursor;
3. Registration represents the legal requirement for the retailer to register the information of the purchaser of the precursor. Registration can then lead to investigation and/or tracking the sale of precursors; and
4. Schedule represents placing the precursor on the schedule of controlled substances. This typically is used when enforcement is deemed necessary

and places the potential for fines and imprisonment of those within the chain of sale who fail to follow the proper procedures for sale and distribution of the controlled precursor.

B. DESCRIPTION OF TERMS

Point of sale restriction: The state has laws or regulations that place restrictions on pseudo ephedrine at the point at which it is sold. These restrictions can include quantity restrictions, packaging restrictions, placement within a store, etc

Scheduling: The state currently lists ephedrine and/or pseudoephedrine as a scheduled controlled substance; however states that have scheduling may also have specific exemptions for over-the-counter products.

There continues to be disparities between the various states in that some states have stringent laws governing precursor chemicals while other states do not regulate precursor chemicals at all. However, when individual states vary in regards to their legislative response to a potential concern, Congress may decide to step in. In the next area, federal legislation, the various federal bills effecting methamphetamine production are discussed.

C. FEDERAL LEGISLATION

When one state has point of sale restrictions but a neighboring state does not, the purchaser can simply drive to the state with no restriction to obtain the necessary precursor chemicals. If the various states do not provide laws which are consistent with one another it may be necessary for the federal government to pass laws that would provide the necessary consistency across all states. A concern then of the various states would be that of mandated costs. When the federal government passes laws that affect the states, yet do not fully fund the effect of the law, the law becomes an unfunded mandate. However, when states do not coordinate important legislation, the federal government may deem it necessary to become involved.

During the 2005 legislative session Congress and the U.S. Senate introduced more than 18 pieces of legislation which would provide both legislative consistency in

defeating methamphetamine production and limited funding through grants to implement the legislation. The following are examples of some of the federal legislation introduced during the 2005 session:

S.430 – Provides grants to states to address the manufacture, sale, and use of methamphetamine to enhance public safety through community based education, awareness, and prevention as well as procure equipment, technology, or support systems. This legislation also provides for grants to regional consortia to develop a comprehensive, cooperative strategy to address the use, sale, and manufacture of methamphetamine. In addition the legislation would provide for the establishment of a national clearinghouse of information on effective programs and sharing of best practices among states.

H.R.13 – Designates as hazardous certain byproducts of the methamphetamine production process and expands penalties against laboratory operators. It also provides grants to State and local law enforcement for specified training, equipment acquisition, and educational programs.

H.R.314/S.103 – Authorizes funds to provide training to State and local law enforcement agents for investigation, expands the public safety and community policing grant program to hire personnel and purchase equipment and adds pseudo ephedrine to schedule V list of controlled substances.

H.R.798 – Addresses developing new methamphetamine detection technologies with an emphasis on site detection.

H.R.1056 – Authorizes the Attorney General to request a distributor of a chemical in the chain of distribution to provide information on such distribution, including sales of the chemical. This legislation would also provide point of sale restrictions of ephedrine or pseudo ephedrine at retail by limiting the amount that can be sold to individuals.

1. Federal Laws Requiring Point of Sale Restrictions

While Congress has introduced a number of bills to combat methamphetamine production, as of August 30, 2005 the various pieces of legislation were still pending and have not yet been passed. The approaches Congress is considering are consistent with

the approaches included in this thesis. Whether the legislation will be effective remains to be seen, but it is encouraging to see this type of commitment on the part of Congress and the U.S. Senate.

IV. CHALLENGES OF CONTROL

The knowledge by which chemicals can be used as well as the process by which they can be manufactured into explosives already exists, yet the technical information is not centralized and no attempt has been made to associate the chemicals with products available in local retail stores. This would be good if the desire is to keep the information out of the hands of those who would misuse it. However, with the multitude of bomb making information available on the internet anyone with the desire and willingness to invest a little time in searching the internet would find enough information to enable them to build an IED that could be used to commit a terrorist act. First responders do not necessarily need to possess the knowledge to construct IEDs in order to recognize the components of IED precursors. They do need to understand the basic concept of IED construction and the potential dangers to person and property. First responders should not be uninformed in regard to explosives, especially when terrorists continue to learn more advanced methods of explosives manufacture.

A. TERRORIST TRAINING

Not only can individuals obtain information on manufacturing explosives from common chemicals, terrorist organizations are providing formal classroom instruction on this subject. Recently a terrorist training manual was obtained and reviewed. Part of the training manual had the following instruction:

1. Pakistani Terrorist Training Manual

"This is the kind of course that teaches us how to make deadly explosives and lethal poisons from easily available substances anywhere on the market or anywhere across the globe."¹⁷

The notebooks contained detailed information on techniques for:

- Producing a wide variety of bombs from chemicals available on the open-market;
- Adaptation of everyday household electrical components - for example the timer on a washing machine - into switches and detonators, including remote and time-delay switches, and electric, mechanical, and impact detonators;

¹⁷ Ansari, "JTIC Exclusive."

- The safe handling and storage of explosives and volatile chemicals; and
- How to set up a secure, safe and clandestine bomb-making laboratory in an urban environment.

B. ADDITIONAL TRAINING REQUIRED

It appears that more information needs to be provided to first responders as they often times are the first to come into contact with explosives, either inadvertently or by being targeted by a terrorist. I suggest that relatively few law enforcement and fire personnel have been trained adequately on what to look for in the way of precursor chemicals when doing investigations or entering buildings. In addition, Emergency Medical Technicians also need awareness training as they may be the first and only team to enter a premise and thus would then be the only witness to a potential improvised explosive devise bomb making facility.

Explosives experts (bomb squads) are very aware of the various types of precursor chemicals, the supplies necessary to manufacture explosives and the procedures involved in constructing bombs. Until recently bomb experts have not been forthcoming with the information that they so carefully guard. The premise has been that the greater the number of people who know how to make explosives the more likely explosives will appear in the communities they protect. A second reason for guarding the information is to protect the first responder. Bomb experts believe that a little knowledge is a dangerous thing. They have spent years learning their profession and to explain the process of bomb making to those who lack the experience could be dangerous to the first responders who may then consider themselves bomb experts.

With recent world events involving explosives, coupled with the increased availability of obtaining bomb making information on the internet, bomb experts have begun to change their tactics and provide information to first responders. Every basic explosives seminar I have attended addresses the student's limited knowledge of explosives and advises them that they should not attempt to disarm or even touch a potential explosive device. Students are taught to secure the area and evacuate to pre-

established distances. First responders are told to call the bomb squad and to not touch anything that resembles a bomb. Then the training continues with what bombs look like and the forms bombs can take.

What is lacking in the current training is the use of precursor chemicals used to manufacture explosives. It appears to be vitally important that additional training in explosives awareness classes should include the chemicals and supplies that are used in manufacturing an IED. In this way, first responders will be better aware of their surroundings when they enter a building or a room.

Early detection of bomb manufacturing can be instrumental in saving lives of first responders, members of the community at large, and investigations involving bomb makers.

1. Examples of bombings

Examples of some of the bombings that have happened in the world in the past 24 years include:

1. Between 1980 and 1990, there were 12,216 bombings in the United States, causing 1,782 injuries, 241 deaths and almost \$140 million of property damage.¹⁸
2. Between 1990 and 1994, there were 8,567 bombings and nearly 2,000 additional bombing attempts.¹⁹
3. Most of these explosions involved pipe bombs (53 percent in 1990) charged with low-velocity filler, such as black powder, and packed with fragments that would extend fragmentary and thermal injuries.²⁰
4. While only a small proportion of these attacks were classified as terrorism, explosives and incendiaries are the weapons of choice used by terrorists throughout the world.²¹
5. In most bombings, however, many more are injured than killed. For example:
 - a. In the February 26, 1993 bombing of the World Trade Center, six people were killed, but more than 1,000 were injured;²²

¹⁸ U.S. Department of Justice, "Bomb Summary," *FBI Bomb Data Center* (Washington, DC, 1990).

¹⁹ Ibid.

²⁰ U.S. Bureau of Alcohol, Tobacco and Firearms (BATF), "Statistics 1990-1998" (Washington, DC, 1998).

²¹ Ibid.

²² National Memorial Institute for the Prevention of Terrorism, "Terrorism Incidents & Significant Dates," <http://www.mipt.org/incidentcalendar.asp>, [Accessed Sept 18, 2005].

- b. At the April 19, 1995 Oklahoma City bombing, 168 people were killed and 850 injured;²³
- c. The August 7, 1998 bombing of the US embassy in Nairobi, Kenya 291 people were killed and over 5,000 were injured;²⁴
- d. On August 15, 1998 a 500-pound car bomb exploded outside a local courthouse in Omag, Ireland killing 29 persons and more than 330 injured;²⁵
- e. On October 18, 1998 a bombing of an oil pipeline in Antioquia, Colombia, killed approximately 71 and 100 injured;²⁶
- f. On August 2, 2000, in Rajwas, India, a grenade thrown on an open fire in a community kitchen killed 30 with 47 injured²⁷

C. REPOSITORY OF INFORMATION

A repository of explosives information should be maintained in order for first responders to better identify precursor chemicals as well as the process of explosives manufacture. In addition, a repository of explosives information would be beneficial in providing a robust database for training purposes. An appropriate level of awareness training, pertaining to common chemicals and precursor chemicals, needs to be provided to first responders.

The lack of precursor awareness information is not limited to first responders though. Apparently the Department of Defense does not consider the subject at all as they do not include the term ‘common chemical’ in the list of DOD Dictionary of Military Terms, and when defining ‘precursor chemical’ the definition is limited to the drug definition.²⁸ The DoD has been more concerned with military munitions and commercial grade explosives being used as IEDs rather than common household products.

²³ Oklahoma City National Memorial website, <http://www.oklahomacitynationalmemorial.org/> [Accessed Sept 18, 2005].

²⁴ U.S. Department of State, Bureau of Public Affairs, “Chronology of Significant Terrorist Incidents, Patterns of Global Terrorism 1998,” <http://www.state.gov/www/global/terrorism/1998Report/appa.html> [Accessed June 21, 2004].

²⁵ Ibid.

²⁶ Ibid.

²⁷ U.S. Department of State, Bureau of Public Affairs, “Chronology of Significant Terrorist Incidents, Patterns of Global Terrorism 2000,” (April 2001) <http://library.nps.navy.mil/home/tg/chrono2000htm> [Accessed September 19, 2005].

²⁸ U.S. Department of Defense, *Department of Defense Dictionary of Military Terms* (As amended through 31 August 2005), <http://www.dtic.mil/doctrine/jel/doddict/> [Accessed September 19, 2005].

The Bureau of Alcohol, Tobacco, and Firearms (ATF) recognizes common chemicals as precursors to potential explosives but has addressed the issue at the manufacturing level and only for certain products. However, there are quite a few common household products that can be used as precursors to explosives that are not controlled or regulated; all that is needed to manufacture explosives is the instruction. This tends to mean the only way to limit common chemicals and common household products from being utilized as precursor's to explosives is to control or limit the information, in the form of instruction, which is available to the public. Whether an attempt is made to remove that type of information from the shelves of the library or from the internet, the public will undoubtedly believe their civil rights are being violated. Civil rights advocates argue that it is the right of a free people to share information freely, especially if no harm is intended through the release.

The challenges for a government to restrict the rights of its citizens to freely share information among them, or to purchase legal products for their own personal use, are huge. For instance, does the citizenry of a free society have the right to collect and share information that has the potential of being used as a weapon of mass destruction? Should a free society allow for the unrestrained assimilation and distribution of information believing that the positives of freedom of speech outweigh the negatives of the potential misuse of that information? If a government deems it necessary to restrict the distribution of information that it believes to be destructive to society as a whole, how does it determine which information is destructive and thus needs to be restricted? At what point is censorship acceptable to a free society? Would a free society be willing to relinquish a portion of its freedom of speech if it were demonstrated through a violent terrorist act that the unrestricted distribution of certain information was a contributing factor to the violent act? At what level of censorship would the issue of freedom of speech be considered restricted?

In a like manner, what would be the effect of restricting citizens of a free society from purchasing legal products? There are currently many examples of products that are not only legal to purchase but are also legal to possess as long as the products are not combined. Such is the case with products used to make methamphetamines. Individually, the majority of products that contain certain chemicals (such as lye, lithium,

red phosphorus, anhydrous ammonia, etc) used in the manufacture of methamphetamines are legal to purchase and possess. However, if the chemicals are combined to form the byproduct methamphetamine, both the manufacture and the possession of the byproduct are considered a felony. The question here may not be so much as ‘should’ the government try to suppress the purchase or ability to obtain certain products as much as ‘could’ they be successful in preventing individuals from obtaining them. Most products that are freely available to the citizenry have a useful purpose, but combined with other legal products become a dangerous substance. The example of TATP, a high explosive commonly used by terrorists, is an example of utilizing common household products and readily available instruction to manufacture the explosive. Triacetone triperoxide (TATP) can be manufactured by combining fingernail polish remover (acetone), hair dye (hydrogen peroxide), and drain cleaner (sulfuric acid). Governmental regulation of these three products would have a detrimental financial impact on commerce as well as the citizens who use these products for the purpose they were intended.

There are instructions, both in print and placed on the internet, that appear to go too far and have no practical use. Consider these directions that downloaded from the internet on draino bombs:

Draino Bombs are created by taking any plastic film canister and filling 3/4 of the canister with Comet. Fill the rest with Draino and put the lid on it. Take this mixture to a cop car and drop it in the gas tank. Run like hell. In about ten minutes the car will explode like in the movies.²⁹

Should this type of instruction be removed from a repository of information? Could it be removed? Should first responders be concerned about the vast amount of information available to the public that could be used to do harm? Can they do anything to prevent it?

Repositories of information, whether in a public venue such as the library or the internet, can be a source of valuable information to first responders. Knowledge is power; the more aware first responders are of potential threats and how to counter those threats, the safer both the first responder and the public will be. Not being informed on potential terrorist tactics empowers the terrorist to create havoc and cause loss of life and destruction of property.

²⁹ Mike M. Castle, “Draino Bomb,” from mlcastle.net (updated March 7, 2005), <http://mlcastle.net/raisethefist/draino.html>, (June 21, 2004).

First responders need to be as informed as possible on the various methods of explosive manufacture as well as current terrorist tactics. Having a repository of information, restricted with the 'For Official Use Only' (FOUO) caveat, available to first responders, would provide the information on explosives manufacture and terrorist tactics necessary for emergency responders to counter potential terrorist attacks. Then, if they believed a threat was valid, they would be able to take the necessary action to defeat the threat. Using the example of the 'draino bomb,' emergency responders could decide whether they believed that threat to be viable or not and then take any necessary precautions to prevent it from happening. They may decide to put locking gas caps on all of their vehicles, or they may not. Either way they were able to make an informed decision based upon information they obtained from a repository of information. Unless law enforcement is aware of potential threats they might not consider taking preemptive actions to counter the threat.

Another example of how easy it is to locate the instructions for explosives manufacture is trinitrotoluene or TNT. "TNT is a high explosive but, unlike nitroglycerin, it is unaffected by ordinary shocks and jarring and must be set off by a detonator. Because it does not react with metals, it can be used in filling metal shells. It is often mixed with other explosives, e.g., with ammonium nitrate to form amatol."³⁰ Here the basic information is found in an encyclopedia. Then the actual instructional material can be found in public documents such as "[TNT] is made by combining toluene (which can be purchased at chemical supply houses or paint stores) with a mixture of nitric acid and sulfuric acid."³¹

Information that can be used to manufacture explosives is not limited to just the internet, public agencies also publish it. As long as someone has the desire to make explosives and does not mind spending a little time doing the necessary research, they can become a very dangerous terrorist.

In case it is argued that this type of information should be banned from the internet, notice where the information was obtained. One source is a public health

³⁰ The Columbia Electronic Encyclopedia, 6th ed. 2005, <http://columbia.thefreedictionary.com/2,4,6-trinitrotoluene> [Accessed September 15, 2005].

³¹ Agency for Toxic Substances and Disease Registry, *Public Health Statement for 2,4,6-Trinitrotoluene*, CAS# 118-96-7, June 1995. <http://www.atsdr.cdc.gov/toxprofiles/phs81.html> [Accessed Sept 18, 2005].

agency and the other is an encyclopedia. All that is required is a little research, a basic knowledge of chemistry, and the desire to blow something up.

The reason common chemicals are used to manufacture an IED is due to the ease with which the material can be obtained. “Common chemicals may be used because standard military chemical agents may be difficult or dangerous to manufacture, access, or disperse.”³² Although the military does misplace (or lose) explosives, the military does have strong safeguards that reduce the possibility of a terrorist stealing military grade explosives. Why should a terrorist concern themselves with military safeguards when they can obtain the precursors in the community without anyone taking notice of their actions?

However, there is a list of controlled chemicals and the list is added to periodically in an attempt to limit the possibility of it falling into the wrong hands. In 2002 the ATF added to their list of explosive materials five items, two of which were HMTD (hexamethylenetriperoxidediamine) and TATP (triacetone triperoxide), “because their primary or common purpose is to function by explosion.” The report went on to state that “ATF has encountered the criminal use of some of these materials in improvised devices.”³³ As with the case of methamphetamines, the products used to manufacture TATP are legal to purchase and possess, however, if the chemicals are combined to form the byproduct TATP, both the manufacture and the possession of the byproduct are considered a felony.

Congress has been attempting to pass laws prohibiting the distribution of information pertaining to bomb making but limits it to those who knowingly release the information to persons they believe will use the knowledge for illegal purposes.

An instructor or distributor can only be prosecuted under the provisions if he either (I) intends the instruction or information to be used for or in furtherance of a federal crime of violence or (II) knows that the person to whom the instruction or information is given intends it to be used for or in furtherance of a federal crime of violence. A federal crime of violence is

³² Joseph L. Hughart, CDR and Mark M. Bashor, “Industrial chemicals and terrorism: Human Health Threat analysis, Mitigation and Prevention,” *U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry*, (updated 4/6/1999), 1. <http://www.mipt.org/pdf/industrialchemicalsandterrorism.pdf> [Accessed September 15, 2005].

³³ U.S. Department of the Treasury, Bureau of Tobacco, Alcohol and Firearms, *Commerce in Explosives; lists of explosive materials*, Update 4/26/02, 1-2, <http://www.atf.treas.gov/pub/fire-explo/pub/listofexp.htm> [Accessed April 23, 2004].

one that (a) “has as an element of use, attempted use, or threatened use of physical force against the person or property of another,” or (b) “is a felony that, by its nature, involves a substantial risk that physical force against the person or property of another may be used in the course of committing the offence,” 18 U.S.C. 16; see also 18 U.S.C. 924(c)(3).³⁴

It is very difficult to limit what can be placed on the internet. United States law would not have any direct effect on someone residing in another country, such as Iraq for instance, from placing bomb making information onto the internet. If a resident of any of certain nations, unfriendly to the United States, wanted to post information on the internet directed towards domestic terrorist groups, edging them on to bomb law enforcement or fire fighters, there would not be much the United States government could do to stop them from posting that information onto the internet.

³⁴ Charles Doyle, “Bomb-Making Online: An Abridged Sketch of Federal Criminal Law,” (Library of Congress: CRS, September 10, 2003).

THIS PAGE INTENTIONALLY LEFT BLANK

V. RECOMMENDATIONS AND CONCLUSION

On April 24, 1996 the Antiterrorism and Effective Death Penalty Act of 1996 was enacted into law. Section 732 of the Act mandates the Secretary of the Treasury conduct a study of tagging explosive materials and rendering common chemicals used to manufacture explosive materials inert, impose controls on certain precursor chemicals and require state licensing for the purchase and use of commercial high explosives.³⁵

In 1995 the ATF hosted an International Explosives Symposium which addressed issues concerning the identification and detection of explosives, neutralizing common or precursor chemicals used in the manufacture of improvised explosive devices, and developing new and innovative ways to combat the criminal use of explosives. As a result of the Symposium, and in an effort to demonstrate an example of possible voluntary controls, ATF teamed with The Fertilizer Institute to design a program to alert the fertilizer industry to the issues of security, knowledge of purchasers, and the need to recognize thefts. The program, "Be Aware For America," has been a source of invaluable information on voluntary efforts. As part of this awareness program, ATF provides a toll-free hot-line number (1-800-800-3855) for reporting suspicious activities.³⁶ In addition, ATF has consulted extensively with representatives of the explosives, fertilizer, and chemical industries to take advantage of their technical expertise on this issue, and to receive their opinion on the economic impact of requiring taggants in explosive materials, the feasibility and practicability of rendering common chemicals inert, and placing controls on certain precursor chemicals used to manufacture explosive materials.³⁷

The result of the study by the Department of the Treasury, Progress Report, Study of Marking, Rendering Inert, and Licensing of Explosives Materials, 1997, determined that rendering common chemicals, including AN, inert would render them ineffective, in most cases, for their intended purposes. The Study Group met with officials from the British Ministry of Defense to discuss their efforts to desensitize AN. Between 1972 and 1996, all efforts by the British government to render AN less explosive were countered

³⁵ *Progress Report*, 2.

³⁶ U.S. Bureau of Alcohol, Tobacco and Firearms, *Be Secure for America* <http://www.atf.gov/pub/threat/secure2.htm> [Accessed June 23, 2004].

³⁷ *Progress Report*, 3.

by certain bomb makers. British officials who have focused on the prevention of AN bombs advise that there is currently no known method which is both feasible and cost-effective by which to desensitize AN and render it non-explosive, while maintaining its effectiveness as a fertilizer.³⁸

It has been suggested that it may be more feasible to establish controls on some common chemicals rather than attempt to render them inert. Since many chemicals have widespread non-explosive uses, it does not appear to be feasible to impose voluntary or mandatory controls on all precursor chemicals but rather focus on those precursor chemicals that have the greatest utility in the manufacture of explosives.

In 2002 the ATF added to their list of explosive materials five items, two of which were HMTD (hexamethylenetriperoxidediamine) and TATP (triacetonetriperoxide), “because their primary or common purpose is to function by explosion.” The report went on to state that “ATF has encountered the criminal use of some of these materials in improvised devices.”³⁹ By adding additional products to their list of explosive materials, ATF allows law enforcement agencies the legal authority to make arrests and file charges against those who possess the materials, thereby using deterrent as a preventative means of restricting the use of these materials. It may be necessary to add more chemicals to the list of explosive materials to better cover other precursor chemicals.

Legislative action may also be required, either on the federal or individual state level, to enact laws reflective of the laws already in force dealing with methamphetamine chemicals. While many states regulate the sale and distribution of precursor chemicals that can be used to manufacture methamphetamines, some states do not regulate precursor chemicals. This lack of consistency between states allows for precursor chemicals to be purchased simply by crossing state lines. What is illegal to purchase in one state is legal to purchase in another state. To defeat this inconsistency, if the states do not address it themselves, Congress may need to pass federal legislation to bring consistency in regulation. However, whether legislation is an effective tool in defeating access to precursor chemicals needs to be assessed. An assessment to determine the success of various laws may be determined by monitoring the effectiveness of

³⁸ Ibid.

³⁹ *Commerce in Explosives*, 1-2.

methamphetamine defeat in each state. If legislation proves effective to defeat the manufacture of methamphetamines, then similar laws may also prove effective in defeating access to precursor chemicals used to manufacture explosives.

A. AWARENESS TRAINING

Of all the approaches to defeating the manufacture of explosives, awareness training may be the most productive. In addition to providing first responders with the basic knowledge needed to recognize potential hazards and explosives devices, the training should contain additional information on what types of common products can be used to manufacture explosives. Although many awareness courses currently contain the type, design, construction method and the components of improvised explosives, they lack information on common chemical derived explosives. Training currently includes such things as recognizing explosives devices as well as secondary devices. However, additional information needs to be incorporated into awareness training such as the types of common products that may be utilized, as well as the various construction methods used, in the explosives manufacturing process.

It is not only important to understand the threat of IEDs, it is equally important to understand the types of explosives that can be incorporated into such devices. Armed with the knowledge of the various products and methods utilized to manufacture explosives, first responders will be better prepared to identify potential bomb labs. Early recognition of potential bomb labs should lead to a decrease in IED incidents. However, to defeat IED deployment first responders also need to be aware of what to report to enable the information to be utilized. Law enforcement authorities need to gather, and share with other agencies, pertinent information regarding potential explosives threats found in their respective communities. When neighboring agencies share information with each other the potential for preventing criminal activity increases. The manufacturing of explosives with the intent to hurt or damage person or property is a criminal activity that needs to be treated in the same way as other criminal activities. By sharing information involving potential bomb labs, first responders will improve the chances of defeating IED deployment thereby saving loss of life and property.

B. INFORMATION SHARING

Terrorism has the capability to threaten the citizens of the United States physically, emotionally, psychologically, and economically. Terrorists are criminals and the best way to identify potential terrorists is through a criminal database constructed and shared by the law enforcement community. Terrorists can wreck unprecedented havoc upon the nation and its citizens if they are left unchecked. Standing between the terrorists' criminal activities and the safety of the nation's citizens are the local law enforcement agencies. Each law enforcement agency knows and understands their individual community and is adept at recognizing unusual patterns within their community. The problem is that although law enforcement agencies know their individual communities, they are not familiar with other communities, even their neighboring communities. In addition, the large amount of collected data makes it difficult to associate disparate pieces of information. Actually, no individual has the capability of data mining multiple databases in order to identify relationships of disparate information. It takes a computer, utilizing the proper software, to identify relationships beyond the basic one or two degrees-of-separation. This is especially true when investigators and officers need to rely on information located in the database of a neighboring jurisdiction.

Criminals are not too concerned with which community they commit their unlawful activities. Criminals will frequently carry out their activities across jurisdictional borders. Criminals count on a lack of information sharing taking place between the law enforcement agencies of neighboring communities in order to increase the chances of their criminal activities remaining undetected.

Information sharing is a very large part of a criminal investigation. Although many law enforcement agencies share certain information with their neighboring law enforcement agencies, most of the information shared is on a case-by-case basis, and then only when additional information is needed for a particular investigation. Due to a lack of resources (financial and personnel), most rural law enforcement agencies lack a reliable, robust information sharing network that can be accessed anytime it is needed.

A secure, cost effective, user friendly, web-based, information sharing network can provide a potential benefit to any local law enforcement agency, allowing that agency

to share real-time information with law enforcement agencies in other communities. Add to the information sharing capability the ability to identify relationships between disparate pieces of data, and the law enforcement agencies have a robust, shared relational database at their disposal.

Information sharing between law enforcement agencies is the best way to track terrorist activity. One common activity terrorists need to participate in is raising funds. Financial resources are essential for terrorists to project power, influence and domination over other people. Terrorist's criminal activities include, amongst others, the manufacture and marketing of drugs, also known as narco-terrorism. Narco-terrorism is prevalent in countries such as Columbia and Afghanistan, but makes its way into the streets of the United States. The profits derived from drugs are used by terrorists to provide protection to the farmers raising the crops as well as to purchase weapons to further their causes. Although narco-terrorism is currently present in the United States, there doesn't appear to be a strong relationship between meth and terrorists at this time. However, that can change rapidly. Should the conditions change so that meth becomes an easy way to generate income, terrorists may begin to use it as a means by which to raise funds to carry on terrorist activities. Investigators and officers can benefit by searching for relationships between meth labs in their, and neighboring, jurisdictions.

In Figure 1 there is no apparent direct link between nodes ML-1 and ML-3 (one degree-of-separation). However, there is a link between the ML-1 and ML-3 through ML-2 (two degrees-of-separation). In this case ML-2 could be a vehicle, another person, an address, a criminal activity, etc. By examining the various links between nodes, associations can be identified to assist the law enforcement agent in the investigation. In Figure 1, ML-6 and ML-7 have only one link each representing a potentially small connection within the community. ML-4 has four links whereas ML-2 and ML-5 each have three links. This would indicate ML-4 as being the node to consider as having the most significant connection to the community.

1. Link Analysis

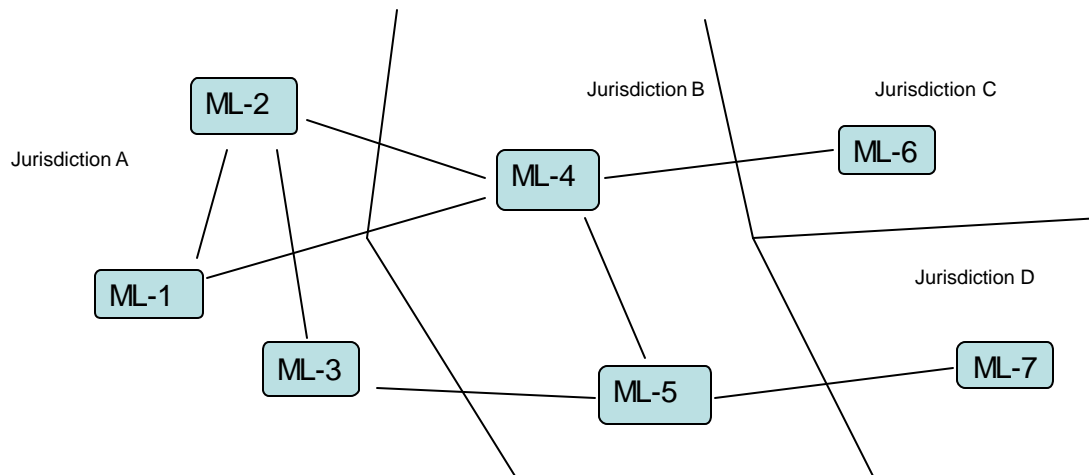


Figure 1. Example of Linked Associations

Law enforcement authorities can curtail both criminal activity and terrorist activity concurrently where associations (links) can be determined. “In a law enforcement and intelligence context, ‘link analysis’ means uncovering relationships that may be indicative of suspicious patterns, groups, or connections. Oftentimes, these relationships are diagramed to facilitate further analysis. Sophisticated link analysis programs are often capable of calculating the statistical significance of the diagram relationships.”⁴⁰ Link analysis programs are available to law enforcement agencies, and have been since 1989. However, the cost of these programs has been prohibitive for smaller, rural agencies. One of the first link analysis programs, Analyst Notebook, was created in England for law enforcement to track criminals. In the fifteen plus years since Analyst Notebook was created many governmental agencies have begun to use it. The cost continues to be prohibitive for smaller agencies and the training curve is high. It takes a skilled operator time and practice to master the program.

The ability to share information between law enforcement agencies effectively and efficiently cannot be understated as an important issue. Officers are proficient at putting together pieces of information and forming a large picture to aid in solving

⁴⁰ Hamid R. Nemati and Christopher D. Barko, *Organizational Data Mining: Leveraging Enterprise Data Resources for Optimal Performance* (Hershey, PA: Idea Group Publishing, 2004), 145.

crimes. But being able to ‘connect the dots’ from different incidents in a timely manner is not always possible, even when one knows the ‘right’ people and what to ask.

Sharing information in a common database with other agencies, and then being able to determine relationships in a timely manner, will help law enforcement officers to find more of the ‘dots’ in which to connect. Small, rural law enforcement agencies often do not have the resources to obtain the more robust tools that large metropolitan police departments have, such as a web-based, shared relational database. Yet these small agencies are expected to be proficient at solving crimes. Information sharing between law enforcement agencies, through a shared relational database, is a beneficial tool for law enforcement officers and may be one of the most effective tools in policing. However, if information is not shared vertically (between the various levels of government) as well as horizontally (between comparable agencies) then its effectiveness diminishes. One of the reasons is the requirement that individuals have appropriate security clearances in order to see classified intelligence at the state and federal level. All too often the information that flows from the local level to the state or federal level does not find its way back to the local level in the form of intelligence. Intelligence as defined here has the meaning of information that has been processed by subject matter experts and determined reliable. The level of sensitivity of the intelligence determines its level of classification.

The sharing of intelligence/information is as important today as ever before. Unfortunately, today’s intelligence procedures are based upon the Cold War era when the enemy was a foreign-based, state-sponsored adversary. Today the enemy is faceless and lacks state sponsorship. This change in enemy status needs to be recognized with new intelligence procedures that are adaptable to the new enemy. This means having the ability to simultaneously share intelligence/information both vertically and horizontally, from the collector to the consumer. However, one issue that has been virtually overlooked in the intelligence field is that of considering the first responder as both an intelligence collector as well as an intelligence consumer. The issue of sharing intelligence between intelligence collections agencies and first responders (such as local law enforcement authorities) has been one of major conflict, disagreement and confusion.

Prior to the September 11, 2001 attack on the United States it was almost impossible to share information between intelligence agencies, due to perceived intelligence propriety and stove piping, as was noted by the 9-11 Commission. As difficult as it has been for intelligence agencies to share information between themselves and federal law enforcement agencies, it has been even more difficult to share intelligence between intelligence agencies and local law enforcement officials. In addition, sharing of intelligence between federal law enforcement agencies and other first responders, such as fire chiefs, has been virtually absent. Yet it is the local law enforcement, and other local first responders, who are going to be the first on the scene of any terrorist attack. To solve this lack of information sharing the terms proprietary and stove piping need to be replaced with the terms cross-domain and horizontal sharing.

The cultural bias in the intelligence and law enforcement communities not to share information has been and continues to be a significant problem. To complicate the problem even further is the lack of information sharing between the foreign and domestic intelligence/law enforcement communities. Although The Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT Act, P.L. 107-56) provides the statutory authorization for greater intelligence sharing between the foreign and domestic intelligence/law enforcement communities, little has been done to address the needs of domestic intelligence sharing between the intelligence and law enforcement communities.

One element that rings clear is that the United States will once again be attacked by terrorists; it is no longer a matter of if, but when. Following the September 11, 2001 attacks on the World Trade Center in New York City and the Pentagon in Washington, DC, questions were asked of the intelligence community as to why no intelligence agency had an idea that it would happen. The argument was - anything that took so much planning, over such a prolonged period of time, and involved so many people, intelligence agencies must have had some idea that an attack was at least imminent. The 9/11 Commission determined that the problem resided in a lack of communications between the various intelligence communities. Although the “dots” were there, the ability to “connect the dots” was lacking. As a result, 37 months later the Congress and Senate passed the Intelligence bill that puts all intelligence agencies under the umbrella

of one person who will be appointed by the President of the United States and confirmed by the Senate. At long last all intelligence agencies 'should' (hypothetically) be able to communicate between themselves and, thus, share intelligence.

Provided this is true, and for argument sake let's assume it will be; the problem now lies in communicating the intelligence collected by those agencies with those who actually are on the front line – the first responders. It is not the analyst that will be confronting a terrorist or responding to a terrorist incident – it will be the law enforcement officer, the fire fighter or the emergency medical technician. The first responder will do what they do so well, respond to an incident, unsuspecting that they are about to encounter the act of a terrorist. When that day comes, and it will, we will see more of our 'heroes' die needlessly in the streets of homeland America. It may not be New York City or Washington, DC. It may not be San Francisco or Dallas. It may be somewhere in Iowa or Nebraska, somewhere in the heartland of the United States. On a daily basis, military intelligence forces are assimilating data on counter-terrorism issues. If civil authorities could be assured that terrorist techniques would never be imported into the United States, they would not need be concerned with the issue. However, no one can assure civil authorities that terrorists will not import their techniques into the United States. In addition, it is the first responder that will be the first to arrive at the scene where terrorist activities are being carried out. First responders need to have as many tools available to them as possible in order to protect and defend lives and property. Getting the appropriate information to the appropriate civil authorities in the most expeditious manner is absolutely imperative for them to protect lives and property.

A major goal of terrorists is to cause a lack of confidence of the people in the government of the country they attack. What better way of doing just that than to attack a part of the United States considered a 'safe haven' with unsuspecting residents. First, the heartland is the easiest place for terrorists to hide out as the populace is tolerant and unsuspecting. They are open and trusting people who are willing to welcome any stranger into their homes and at the same time don't want to intrude into the privacy of their neighbors. Secondly, since the heartland is considered to be a safe place to raise a family, there doesn't seem to be a need to invest limited homeland security revenue into protecting it from would be terrorists. Herein lies part of the problem. How can pertinent

information obtained by the various intelligence agencies be shared with the first responders who are trying to protect the heartland of the United States? Furthermore, how can this same pertinent intelligence/information be shared with first responders in other parts of the homeland?

The greatest limitation to sharing intelligence information is the classification level of the information obtained by intelligence agencies. Usually the information is classified as Secret or Top Secret. Even intelligence classified as Confidential is limited as to who can see it. So how does a first responder find out that a suspected terrorist is in their area and has the capability to cause harm to the residents the first responder is supposed to protect? How can the first responder protect the citizens as well as himself or other first responders from becoming injured or killed?

Following are three issues that need to be addressed to allow the sharing of intelligence information with local law enforcement and other first responders:

1. classify intelligence information to the lowest classification possible such as a sensitive but unclassified (SBU) level
2. increase utilization of existing information sharing protocol
3. increase utilization of the information sharing network

In a statement, as reported in the December 1, 2004 issue of the *Daily Briefing*, by former CIA Director George Tenet, Tenet was critical of the direction that intelligence reform is taking in Washington.

There's a big focus on structural change at the top. My perspective is, this is all about data." The U.S. government has "an enormous amount of knowledge" on terrorist activities that should be disseminated to state and local officials. "We have to start treating them as equals with regard to data and teach them as much as we possibly can by pushing data to them at the lowest levels of classification. [We should] even begin a very serious process of learning how to write at the unclassified level so we can educate everybody about what we see going on in the world." "I really believe data sharing and the movement of data is the most critical feature of reform. I think that's where this game gets won and lost.⁴¹

⁴¹ Chris Strohm, "Tenet Warns of Terrorists Combining Physical, Telecommunications Attacks," *Daily Briefing*, December 1, 2004.

Limited information is being shared between federal law enforcement agencies, such as the Federal Bureau of Investigation (FBI) and local law enforcement authorities at a level known as sensitive but unclassified (SBU). The concern is that not enough information is being filtered to local law enforcement, and that much of the type of information being shared is not applicable to local law enforcement needs. As mentioned, information is being provided to local law enforcement from a more centralized agency, such as state terrorism task forces (which are usually run by the FBI) however, to be a member of the task force one must have a minimum of a Secret clearance. The lack of security clearances at the local level is the main reason information sharing is limited. It is not feasible to grant security clearances to all first responders (or even key personnel) and it would be very difficult for local units of government to manage the receipt, storage and dissemination of classified information. It is therefore more prudent to classify at the lowest level possible, preferably SBU, as much intelligence/information as possible. This may mean that intelligence collectors will need to write unclassified reports which can be shared with first responders. One possible way of sharing unclassified information with first responders could be through an existing network already in place between joint terrorism task forces and local law enforcement.

The current network involved in the sharing of information works but needs to be expanded to include other federal agencies. In addition, federal agencies could write their intelligence information (much of it classified) at a SBU level by removing the sensitive data. This sensitive but unclassified (SBU) information would be provided to the joint terrorism task forces for distribution to local law enforcement. Local law enforcement would then share the information with their local fire chiefs. This information could be shared through a secure environment to local law enforcement.

Much of what makes intelligence classified is anything that can be used to determine its source. No one wants the sources of intelligence identified as that would undermine the ability of obtaining more intelligence. However, once certain source identifying information is removed, much of what is left may very well end up being unclassified. Therefore, it may be up to the authorities responsible for the collection of

intelligence to determine what needs to remain classified and what may be classified as sensitive but unclassified (SBU).

It should be recognized that first responders would be not only consumers of unclassified law enforcement sensitive information; they are also valuable collection agents. Since resources are limited, first responders should be an integral part of an information sharing network whereby Washington collects state and local terrorist information and consolidates it in a nationwide threat assessment. First responders are active observers covering the entire homeland and as such are our first line of defense. They see what federal agencies can not see due to a lack of personnel resources.

Any reshaping of intelligence procedures of the order listed above would require the support of the President. President Bush, in an Executive Order dated August 27, 2004, established the Information Systems Council with responsibility to plan for and oversee the establishment of an interoperable terrorism information sharing environment (ISE). The ISE will facilitate automated sharing of terrorism information among appropriate agencies. In turn agencies will give the highest priority to (i) the detection, prevention, disruption, preemption, and mitigation of the effects of terrorist activities against the territory, people, and interests of the United States of America, (ii) the interchange of terrorism information among agencies, (iii) the interchange of terrorism information between agencies and appropriate authorities of States and local governments, and (iv) the protection of the ability of agencies to acquire additional such information.

Experts with the Homeland Security Advisory Council, a panel of mostly state and local officials that advises the federal homeland security secretary, stated that they are releasing a document on December 14, 2004 that recommends "Washington should restructure its domestic intelligence efforts to better coordinate information flowing to and from state and local officials and businesses." The report will advise the Secretary of Homeland Security that:

As both collectors and consumers of intelligence/information, it is critical that state, tribal, local and private-sector efforts be coordinated with those of the federal government - specifically, the intelligence community," "The manner in which our modern-day intelligence community operates was established during the Cold War and designed to confront foreign-based, state-sponsored adversaries, but the world has changed since the

end of the Cold War." Officials "must focus on defining the appropriate roles for state, local, tribal and private-sector entities in the collection, analysis, dissemination and use of this intelligence/information - and how those efforts should be coordinated with those of the federal intelligence community." "This debate represents an historic opportunity to enhance existing intelligence/information-sharing between all levels of government, and the threat to the nation demands that we proceed expeditiously.⁴²

It is time for intelligence/information sharing to be redefined. It is necessary to provide a streamlined flow of meaningful intelligence which needs to be collected, analyzed, examined and disseminated in a timely fashion. This can best be accomplished through the sharing of terrorism information (or more accurately – sharing knowledge) between federal agencies and local first responders. The first responder's role needs to be emphasized as they are closest to the terrorist and will be the most impacted by a terrorist attack in their community. In addition, because of the propensity for terrorists to support their activities through criminal activity, first responders are in an opportune position to identify, and thus prevent, terrorist activity.

In order for information to be provided to both the collector and consumer in a timely and effective manner, a method of streamlining the process needs to be provided. This streamlining of information can be in the form of a fusion center which is an integration of agencies and provides a synthesis of information. Whatever agency takes on the role of fusion center should:

1. address the full scope of terrorism/law enforcement intelligence.
2. have a direct connection to the National Counterterrorism Center.
3. establish a liaison between all agencies and entities involved in homeland security prevention.
4. provide for a common system with all agencies to bring the intelligence together.
5. provide a common voice for intelligence and information sharing matters.
6. provide for a 360 degree awareness of all terrorist activities: plots, recruiting and fundraising – put all the key players under one roof.
7. pass along pertinent information in a timely manner

⁴² Joe Fiorill, "Panel Seeks Broad Terrorism Information-Sharing Changes," *Daily Briefing* (December 13, 2004).

It is therefore essential to utilize all possible resources in order to increase the potential to identify possible terrorists. The most efficient and available resources are the first responders who are aware of their surroundings in their respective communities. First responders represent a cross-section of their community and are the most familiar with its daily events. First responders are a wealth of information which can be pushed into a fusion center where analysts, utilizing all-source intelligence data, can determine if the information supports a threat or not. It is vital to the safety of the first responders and the communities they protect, that pertinent information is pushed back to them in an efficient and timely manner.

C. SUMMARY

Recently the world has seen an increase in both the loss of lives and property as a result of terrorists who have demonstrated their intentions to wreck havoc upon any population that disagrees with their agenda. One of the most common tactics of terror has been the use of explosives with the most common being improvised explosive devises (IEDs). Currently IEDs are being deployed in foreign countries with many being constructed with unexploded military munitions. However, when commercial or military munitions are not available, bomb makers will turn to common products which contain chemicals that are precursors to explosives.

Some of the more common explosives deployed in the United States are Ammonium Nitrate and Fuel Oil (ANFO), and in the case of September 11, 2001, jet fuel. However, another common explosive, triacetone triperoxide (TATP), which is widely deployed against the Israelis by the terrorist group Hamas, has already been introduced by terrorists into the United States. Although TATP has been used most predominately by Hamas, the ease in which it can be manufactured, utilizing common chemicals makes it a very dangerous and deadly improvised explosive device.

To ascertain which approaches would be most appropriate for limiting the usage of common chemicals to the purposes for which they were designed, this thesis contains a study of the various state legislatures in regards to their control of methamphetamines. Methamphetamines are drugs which are manufactured from common chemicals. The possession of the chemicals themselves is not illegal but, once manufactured into a drug,

the possession and/or distribution of the drug becomes a felony. The success (or lack thereof) of the various state legislatures to control common chemicals used to make methamphetamines can be used to predict which legislative action could be effective in preventing the manufacture of improvised explosive devices.

The events that will lead to the deployment of an improvised explosive device within the jurisdictional boundaries of the United States may not be detected by law enforcement authorities. Troublesome as this statement seems, there are proactive steps that can and must be taken early on by emergency responders to preempt the successful deployment of IEDs within the Homeland.

This thesis investigates the potential effectiveness of various approaches to preempt the terrorist's usage of IEDs. Examples of the ease in which explosives can be manufactured and the threat by which common household chemicals can be used to manufacture powerful, destructive and life threatening IEDs are explained. To better understand the philosophy of the various terrorist groups, and the training they receive, an analysis of a Pakistani explosives training manual and a Al-Qaeda terrorist training manual are conducted.

This thesis identifies and analyzes various concepts considered potential solutions in pre-empting the successful deployment of an IED within the homeland of the United States. Options considered included:

1. Status quo – continue as is;
2. Removing precursor chemicals from the market or restricting their sale;
3. Limiting the quantity of certain precursor chemicals by establishing products that can be acquired by establishing purchasing thresholds for each product;
4. Tracking the sale, purchase and distribution of products, which contain precursor chemicals, through a master data base maintained by law enforcement authorities;
5. Providing increased intelligence/information sharing, both vertically and horizontally, between counter-terrorism agencies, law enforcement and other first responders;
6. Providing awareness training to first responders on how precursor chemicals can be used to make explosives; and

7. Providing an awareness campaign directed towards retailers and the general public.

The challenges of each of these concepts were also considered and include:

1. The potential dangers of not recognizing the need to be proactive;
2. The potential financial effect on the retail market, as well as the rights of a free citizenry to purchase legal products, pursuant to removing products from the marketplace;
3. The logistical and technical challenges of placing purchase limitations on products;
4. In addition to the potentially high cost of tracking the sale and distribution of certain products is the concern over the loss of civil liberties when citizens are identified and tracked as a person of interest by law enforcement authorities and maintained in a master database solely due to having purchased a legal product;
5. Implementing a free-flow of intelligence/information among federal, state and local agencies without compromising the security of the data;
6. Designing a training curriculum for emergency responders that provides the necessary elements of awareness and yet adaptable and flexible to meet the varied training requirements of emergency responders; and
7. Designing a public awareness campaign that will be acceptable to the public.

As a laboratory in which to experiment with various concepts and processes to determine which may be most effective, this thesis mirrors the controversy surrounding methamphetamines. First, methamphetamines are manufactured with common products, many of which are found in the average home. Second, any lab capable of manufacturing methamphetamines is capable of manufacturing explosives. Further, the majority of states have identified the production, sale, distribution and use of methamphetamines as a threat that must be addressed. As a result, state legislatures have considered and passed laws that remove, restrict, limit, and track, common household products in an attempt to pre-empt the manufacture of methamphetamines. In addition, state legislatures have

increased law enforcement capabilities to address the methamphetamine threat. Law enforcement in turn has provided an increased emergency responder and public awareness campaign to aid in the early identification of methamphetamine labs. The data gained through addressing the methamphetamine threat lends well as a laboratory in which to determine what may be effective in countering the potential IED threat. Rather than wait for and then respond to an IED event within the United States, it is better to proactively adopt proven laws and tactics. The reality is that if the methamphetamine threat cannot be countered, neither can the IED threat.

D. CONCLUSION

There are common chemicals in our communities that can be used as precursor chemicals for the manufacture of an Improved Explosive Device. This should be an issue of significant concern for not only our first responders (law, fire and medical) but for our citizens as well for the following reasons:

- Precursor chemicals for explosives manufacture are readily available to the general public.
- Many explosives are inexpensive to build and easy to deploy.
- Bombs can be concealed in anything from pipes to trucks.
- It is difficult to track the purchase/theft of precursor chemicals.
- Many chemicals are dual use.
- The purchase of materials is protected under an individual's Civil Rights.

It does not take a chemist to create the proper mixture to manufacture an explosive as there are adequate directions readily available from many sources such as the internet, bomb cookbooks, and informational handouts, to walk the bomb maker through all of the required steps. Even the shopping lists for the precursor chemicals are available and included with the manufacturing directions.

One caution that the bomb maker needs to be aware of, and is included here as a warning to would-be bomb makers in an attempt to thwart their attempt, is that not all information on explosives manufacture is accurate. During the manufacturing process, many of the steps involved in the procedures have to be followed exactly to prevent an

unexpected detonation. One of the tell-tale trademarks of a bomb maker is the loss of fingers and limbs as well as eyesight and multiple burn scars.

Although the information for the manufacturing of explosives is readily available, yet cannot be guaranteed to be accurate, I have opted to not clarify the proper procedures of manufacturing explosives and have decided to settle with a warning to those who contemplate experimenting with explosives – DO NOT ATTEMPT THE MANUFACTURE OF EXPLOSIVES, NOR THE DEPLOYMENT OF IMPROVISED EXPLOSIVE DEVICES.

There does not appear to be any way to render precursor chemicals inert and yet maintain their intended purpose, which is a concern with ammonium nitrate. It also appears that attempting to track or tag, even a limited number of chemicals, would be near impossible to accomplish.

It does appear feasible to add more chemicals to ATF's list of explosive materials to aid law enforcement in apprehending would be bomb makers. It would then follow that legislation should be enacted in order to provide the legal authority to prosecute those offenders.

Finally, additional explosives awareness information should be provided to first responders training so they can recognize, and know the proper response procedures, when they come in contact with precursor chemicals that can be used to manufacture explosives. This awareness has the potential of saving the lives of first responders and citizens and increases the chances of apprehending potential terrorists.

VI. APPENDICES

A. DEFINITIONS

Ammonium Nitrate (AN) – A low density (explosive grade) fertilizer, classified as an oxidizer. An oxidizer is a substance that readily yields oxygen or other oxidizing substances to promote the combustion of organic matter or other fuel. Ammonium nitrate alone is not an explosive material. However, Federal explosives storage regulations require the separation of explosive magazines from nearby stores of ammonium nitrate by certain minimum distances. ⁴³

ANFO - An explosive material consisting of ammonium nitrate and fuel oil. ⁴⁴
The Murrah Federal Building in Oklahoma City was destroyed by ANFO bomb.

Common Chemicals - Any chemical compound or element that, as part of a physical mixture, would be necessary for that mixture to be considered an explosive mixture; or any chemical compound or element that could be classified as an oxidizer or as a readily available fuel. ⁴⁵ Note: DOD does not have a definition for this term.

Detonator - (DOD, NATO) A device containing a sensitive explosive intended to produce a detonation wave. ⁴⁶

Explosive - Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. ⁴⁷

Explosion - “A rapid increase of pressure in a confined space, generally caused by the occurrence of exothermic chemical reactions in which gases are produced in relatively large amounts”. A simpler or wider definition is “a rapid release of energy” ⁴⁸

HMTD - An abbreviation for the name of the explosive hexamethylene triperoxide diamine. ⁴⁹

Identification Taggants - A marker placed into an explosive material that has utility of detection or identification before or after an explosion to identify the manufacturer, the date, and shift when it was manufactured. Once this type taggant is located and identified, the information it provides would allow law enforcement to trace

⁴³ *Progress Report*, 9.

⁴⁴ *Ibid.*, 10.

⁴⁵ *Ibid.*, 25.

⁴⁶ Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 01 (as amended through 3 August 2005), 159.

⁴⁷ *Progress Report*, 36.

⁴⁸ M. Nedved, “Explosion Prevention and Control,” *Occupational Health* 32:7 (1980), 358-362.

⁴⁹ *Progress Report*, 37.

all of the same type explosives manufactured on that specific date and shift to all of the legal purchasers. Taggants can be a solid, liquid, or vapor emitting substance.⁵⁰

Improvised Explosive Devices – (DOD, NATO) A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components. Also called IED. ⁵¹

PETN - An abbreviation for the name of the explosive pentaerythritol tetranitrate.
⁵²

Precursor Chemicals - Any chemical compound or element that can be converted to an explosive compound through a chemical reaction or series of reactions; or a chemical compound or element that can catalyze a reaction in which an explosive compound is synthesized. Precursor Chemicals include: Acetone, Ammonia, Benzene, Butane, Ethylene Glycol, Glycerin, Iodine, Lead, Mercury, Methane, Nitric Acid, Perchloric Acid, Peroxide, Silver, Sulfuric Acid, Toluene, and Urea. ⁵³

Note: DOD definition: (DOD) Compounds that are required in the synthetic or extraction processes of drug production, and become incorporated into the drug molecule. Not used in the production of cocaine or heroin. (DOD Dictionary of Military Terms, as amended through 23 March 2004) The DOD does not address the terms Common Chemical or Precursor Chemical. I am under the impression that since the DOD has not considered these terms in the pretext of explosives, they must not be considering them at all. I need to point out that this is the DOD in general, as I have had conversations with members of military explosives experts and they are very aware of the dangers of precursor chemicals in the manufacture of explosives.

Urea - Used in the production of resins and glues. Industrial resins are used in the manufacture of such forestry products as plywood and oriented strandboard; it is also used in the production of fiberglass insulation, forestry fertilization and on airport runways as a de-icer. Urea is used in the control of NOX emissions. When mixed with ammonium nitrate liquid it is used in effluent treatment. ⁵⁴

⁵⁰ Ibid.

⁵¹ *Dictionary of Military Terms*, 252.

⁵² *Progress Report*, 39.

⁵³ Ibid., 27.

⁵⁴ Ibid., 40.

B. SELECTION OF VARIOUS BOMBINGS WORLDWIDE

There have been many bomb attacks worldwide which have caused the loss of thousands of lives. The following information was derived from the Department of State's Bureau of Public Affairs, through the Office of the Historian and lists a selection of some of the bombings that have occurred since 1961:

Significant Terrorist Incidents, 1961-2003: A Brief Chronology⁵⁵

"Bloody Friday," July 21, 1972: An Irish Republican Army (IRA) bomb attacks killed eleven people and injure 130 in Belfast, Northern Ireland. Ten days later, three IRA car bomb attacks in the village of Claudy left six dead.

Assassination of Former Chilean Diplomat, September 21, 1976: Exiled Chilean Foreign Minister Orlando Letelier was killed by a car-bomb in Washington.

U.S. Installation Bombing, August 31, 1981: The Red Army exploded a bomb at the U.S. Air Force Base at Ramstein, West Germany.

Bombing of U.S. Embassy in Beirut, April 18, 1983: Sixty-three people, including the CIA's Middle East director, were killed and 120 were injured in a 400-pound suicide truck-bomb attack on the U.S. Embassy in Beirut, Lebanon. The Islamic Jihad claimed responsibility.

North Korean Hit Squad, October 9, 1983: North Korean agents blew up a delegation from South Korea in Rangoon, Burma, killing 21 persons and injuring 48.

Bombing of Marine Barracks, Beirut, October 23, 1983: Simultaneous suicide truck-bomb attacks were made on American and French compounds in Beirut, Lebanon. A 12,000-pound bomb destroyed the U.S. compound, killing 242 Americans, while 58 French troops were killed when a 400-pound device destroyed a French base. Islamic Jihad claimed responsibility.

Restaurant Bombing in Spain, April 12, 1984: Eighteen U.S. servicemen were killed and 83 people were injured in a bomb attack on a restaurant near a U.S. Air Force Base in Torrejon, Spain.

Air India Bombing, June 23, 1985: A bomb destroyed an Air India Boeing 747 over the Atlantic, killing all 329 people aboard. Both Sikh and Kashmiri terrorists were blamed for the attack. Two cargo handlers were killed at Tokyo airport, Japan, when another Sikh bomb exploded in an Air Canada aircraft en route to India.

Aircraft Bombing in Greece, March 30, 1986: A Palestinian splinter group detonated a bomb as TWA Flight 840 approached Athens airport, killing four U.S. citizens.

Berlin Discothèque Bombing, April 5, 1986: Two U.S. soldiers were killed and 79 American servicemen were injured in a Libyan bomb attack on a nightclub in West Berlin, West Germany. In retaliation U.S. military jets bombed targets in and around Tripoli and Benghazi.

Kimpo Airport Bombing, September 14, 1986: North Korean agents detonated an explosive device at Seoul's Kimpo airport, killing 5 persons and injuring 29 others.

⁵⁵ U.S. Department of State, Bureau of Public Affairs, Office of the Historian, "Significant Terrorist Incidents, 1961-2003: A Brief Chronology, Historical Background," (March 2004). <http://www.state.gov/r/pa/ho/pubs/fs/5902.htm> [Accessed September 19, 2005].

Downing of Airliner, November 29, 1987: North Korean agents planted a bomb aboard Korean Air Lines Flight 858, which subsequently crashed into the Indian Ocean.

Servicemen's Bar Attack, December 26, 1987: Catalan separatists bombed a Barcelona bar frequented by U.S. servicemen, resulting in the death of one U.S. citizen.

Naples USO Attack, April 14, 1988: The Organization of Jihad Brigades exploded a car-bomb outside a USO Club in Naples, Italy, killing one U.S. sailor.

Attack on U.S. Diplomat in Greece, June 28, 1988: The Defense Attaché of the U.S. Embassy in Greece was killed when a car-bomb was detonated outside his home in Athens.

Pan Am 103 Bombing, December 21, 1988: Pan American Airlines Flight 103 was blown up over Lockerbie, Scotland, by a bomb believed to have been placed on the aircraft by Libyan terrorists in Frankfurt, West Germany. All 259 people on board were killed.

Assassination of U.S. Army Officer, April 21, 1989: The New People's Army (NPA) assassinated Colonel James Rowe in Manila. The NPA also assassinated two U.S. government defense contractors in September.

Bombing of UTA Flight 772, September 19, 1989: A bomb explosion destroyed UTA Flight 772 over the Sahara Desert in southern Niger during a flight from Brazzaville to Paris. All 170 persons aboard were killed. Six Libyans were later found guilty in absentia and sentenced to life imprisonment.

U.S. Embassy Bombed in Peru, January 15, 1990: The Tupac Amaru Revolutionary Movement bombed the U.S. Embassy in Lima, Peru.

Attempted Iraqi Attacks on U.S. Posts, January 18-19, 1991: Iraqi agents planted bombs at the U.S. Ambassador to Indonesia's home residence and at the USIS library in Manila.

Assassination of former Indian Prime Minister, May 21, 1991: A female member of the LTTE (Liberation Tigers of Tamil Eelam) killed herself, Prime Minister Rajiv Gandhi, and 16 others by detonating an explosive vest after presenting a garland of flowers to the former Prime Minister during an election rally in the Indian state of Tamil Nadu.

Bombing of the Israeli Embassy in Argentina, March 17, 1992: Hizballah claimed responsibility for a blast that leveled the Israeli Embassy in Buenos Aires, Argentina, causing the deaths of 29 and wounding 242.

World Trade Center Bombing, February 26, 1993: The World Trade Center in New York City was badly damaged when a car bomb planted by Islamic terrorists exploded in an underground garage. The bomb left 6 people dead and 1,000 injured. The men carrying out the attack were followers of Umar Abd al-Rahman, an Egyptian cleric who preached in the New York City area.

Bombing of the Federal Building in Oklahoma City, April 19, 1995: Right-wing extremists Timothy McVeigh and Terry Nichols destroyed the Federal Building in Oklahoma City with a massive truck bomb that killed 166 and injured hundreds more in what was up to then the largest terrorist attack on American soil.

Jerusalem Bus Attack, August 21, 1995: HAMAS claimed responsibility for the detonation of a bomb that killed 6 and injured over 100 persons, including several U.S. citizens.

Attack on U.S. Embassy in Moscow, September 13, 1995: A rocket-propelled grenade was fired through the window of the U.S. Embassy in Moscow, ostensibly in retaliation for U.S. strikes on Serb positions in Bosnia.

Saudi Military Installation Attack, November 13, 1995: The Islamic Movement of Change planted a bomb in a Riyadh military compound that killed one U.S. citizen, several foreign national employees of the U.S. government, and over 40 others.

Egyptian Embassy Attack, November 19, 1995: A suicide bomber drove a vehicle into the Egyptian Embassy compound in Islamabad, Pakistan, killing at least 16 and injuring 60 persons. Three militant Islamic groups claimed responsibility.

Tamil Tigers Attack, January 31, 1996: Members of the Liberation Tigers of Tamil Eelam (LTTE) rammed an explosives-laden truck into the Central Bank in the heart of downtown Colombo, Sri Lanka, killing 90 civilians and injuring more than 1,400 others, including 2 US citizens.

IRA Bombing, February 9, 1996: An Irish Republican Army (IRA) bomb detonated in London, killing 2 persons and wounding more than 100 others, including 2 U.S. citizens.

HAMAS Bus Attack, February 26, 1996: In Jerusalem, a suicide bomber blew up a bus, killing 26 persons, including three U.S. citizens, and injuring some 80 persons, including three other US citizens.

Dizengoff Center Bombing, March 4, 1996: HAMAS and the Palestine Islamic Jihad (PIJ) both claimed responsibility for a bombing outside of Tel Aviv's largest shopping mall that killed 20 persons and injured 75 others, including 2 U.S. citizens.

Manchester Truck Bombing, June 15, 1996: An IRA truck bomb detonated at a Manchester shopping center, wounding 206 persons, including two German tourists, and caused extensive property damage.

Khobar Towers Bombing, June 25, 1996: A fuel truck carrying a bomb exploded outside the US military's Khobar Towers housing facility in Dhahran, killing 19 U.S. military personnel and wounding 515 persons, including 240 U.S. personnel. Several groups claimed responsibility for the attack.

ETA Bombing, July 20, 1996: A bomb exploded at Tarragona International Airport in Reus, Spain, wounding 35 persons, including British and Irish tourists. The Basque Fatherland and Liberty (ETA) organization was suspected.

Paris Subway Explosion, December 3, 1996: A bomb exploded aboard a Paris subway train as it arrived at the Port Royal station, killing two French nationals, a Moroccan, and a Canadian, and injuring 86 persons. Among those injured were one U.S. citizen and a Canadian. No one claimed responsibility for the attack, but Algerian extremists are suspected.

Israeli Shopping Mall Bombing, September 4, 1997: Three suicide bombers of HAMAS detonated bombs in the Ben Yehuda shopping mall in Jerusalem, killing eight persons, including the bombers, and wounding nearly 200 others. A dual U.S./Israeli citizen was among the dead, and 7 U.S. citizens were wounded.

IRA Bombing, Banbridge, August 1, 1998: A 500-pound car bomb planted by the Real IRA exploded outside a shoe store in Banbridge, North Ireland, injuring 35 persons and damaging at least 200 homes.

U.S. Embassy Bombings in East Africa, August 7, 1998: A bomb exploded at the rear entrance of the U.S. Embassy in Nairobi, Kenya, killing 12 U.S. citizens, 32 Foreign Service Nationals (FSNs), and 247 Kenyan citizens. Approximately 5,000 Kenyans, 6 U.S. citizens, and 13 FSNs were injured. The U.S. Embassy building sustained extensive structural damage. Almost simultaneously, a bomb detonated outside the U.S. Embassy in Dar es Salaam, Tanzania, killing 7 FSNs and 3 Tanzanian citizens, and injuring 1 U.S. citizen and 76 Tanzanians. The explosion caused major structural damage to the U.S. Embassy facility. The U.S. Government held Usama Bin Laden responsible.

IRA Bombing, Omagh, August 15, 1998: A 500-pound car bomb planted by the Real IRA exploded outside a local courthouse in the central shopping district of Omagh, Northern Ireland, killing 29 persons and injuring over 330.

Colombian Pipeline Bombing, October 18, 1998: A National Liberation Army (ELN) planted bomb exploded on the Orensa pipeline in Antioquia Department, killing approximately 71 persons and injuring at least 100 others. The pipeline is jointly owned by the Colombia State Oil Company Ecopetrol and a consortium including U.S., French, British, and Canadian companies.

Car bombing in Spain, January 27, 2000: Police officials reported unidentified individuals set fire to a Citroen car dealership in Iturreta, causing extensive damage to the building and destroying 12 vehicles. The attack bore the hallmark of the Basque Fatherland and Liberty (ETA).

Church Bombing in Tajikistan, October 1, 2000: Unidentified militants detonated two bombs in a Christian church in Dushanbe, killing seven persons and injuring 70 others. The church was founded by a Korean-born U.S. citizen, and most of those killed and wounded were Korean. No one claimed responsibility.

Attack on U.S.S. *Cole*, October 12, 2000: In Aden, Yemen, a small dingy carrying explosives rammed the destroyer U.S.S. *Cole*, killing 17 sailors and injuring 39 others. Supporters of Usama Bin Laden were suspected.

Manila Bombing, December 30, 2000: A bomb exploded in a plaza across the street from the U.S. Embassy in Manila, injuring nine persons. The Moro Islamic Liberation Front was likely responsible.

BBC Studios Bombing, March 4, 2001: A car bomb exploded at midnight outside of the British Broadcasting Corporation's main production studios in London. One person was injured. British authorities suspected the Real IRA had planted the bomb.

Suicide Bombing in Israel, March 4, 2001: A suicide bomb attack in Netanya killed 3 persons and wounded 65. HAMAS later claimed responsibility.

ETA Bombing, March 9, 2001: Two policemen were killed by the explosion of a car bomb in Hernani, Spain.

Bus Stop Bombing, April 22, 2001: A member of HAMAS detonated a bomb he was carrying near a bus stop in Kfar Siva, Israel, killing one person and injuring 60.

Tel-Aviv Nightclub Bombing, June 1, 2001: HAMAS claimed responsibility for the suicide bombing of a popular Israeli nightclub that caused over 140 casualties.

HAMAS Restaurant Bombing, August 9, 2001: A HAMAS-planted bomb detonated in a Jerusalem pizza restaurant, killing 15 people and wounding more than 90. The Israeli response included occupation of Orient House, the Palestine Liberation Organization's political headquarters in East Jerusalem.

Suicide Bombing in Israel, September 9, 2001: The first suicide bombing carried out by an Israeli Arab killed 3 persons in Nahariya. HAMAS claimed responsibility.

Death of "the Lion of the Panjshir", September 9, 2001: Two suicide bombers fatally wounded Ahmed Shah Massoud, a leader of Afghanistan's Northern Alliance, which had opposed both the Soviet occupation and the post-Soviet Taliban government. The bombers posed as journalists and were apparently linked to al-Qaida. The Northern Alliance did not confirm Massoud's death until September 15.

Terrorist Attacks on U.S. Homeland, September 11, 2001: Two hijacked airliners crashed into the twin towers of the World Trade Center. Soon thereafter, the Pentagon was struck by a third hijacked plane. A fourth hijacked plane, suspected to be bound for a high-profile target in Washington, crashed into a field in southern Pennsylvania. The attacks killed 3,025 U.S. citizens and other nationals. President Bush and Cabinet officials indicated that Usama Bin Laden was the prime suspect and that they considered the United States in a state of war with international terrorism. In the

aftermath of the attacks, the United States formed the Global Coalition Against Terrorism.

Attack on the Jammu and Kashmir Legislature, October 1, 2001: After a suicide car bomber forced the gate of the state legislature in Srinagar, two gunmen entered the building and held off police for seven hours before being killed. Forty persons died in the incident. Jaish-e-Muhammad claimed responsibility.

Suicide Bombings in Jerusalem, December 1, 2001: Two suicide bombers attacked a Jerusalem shopping mall, killing 10 persons and wounding 170.

Suicide Bombing in Haifa, December 2, 2001: A suicide bomb attack aboard a bus in Haifa, Israel, killed 15 persons and wounded 40. HAMAS claimed responsibility for both this attack and those on December 1 to avenge the death of a HAMAS member at the hands of Israeli forces a week earlier.

Bomb Explosion in Kashmir, January 22, 2002: A bomb exploded in a crowded retail district in Jammu, Kashmir, killing one person and injuring nine. No group claimed responsibility.

Suicide Bombing in Jerusalem, January 27, 2002: A suicide bomb attack in Jerusalem killed one other person and wounded 100. The incident was the first suicide bombing made by a Palestinian woman.

Suicide Bombing in the West Bank, February 16, 2002: A suicide bombing in an outdoor food court in Karme Shomron killed 4 persons and wounded 27. Two of the dead and two of the wounded were U.S. citizens. The Popular Front for the Liberation of Palestine (PFLP) claimed responsibility.

Suicide Bombing in the West Bank, March 7, 2002: A suicide bombing in a supermarket in the settlement of Ariel wounded 10 persons, one of whom was a U.S. citizen. The PFLP claimed responsibility.

Suicide Bombing in Jerusalem, March 9, 2002: A suicide bombing in a Jerusalem restaurant killed 11 persons and wounded 52, one of whom was a U.S. citizen. The al-Aqsa Martyrs' Brigades claimed responsibility.

Grenade Attack on a Church in Pakistan, March 17, 2002: Militants threw grenades into the Protestant International Church in Islamabad, Pakistan, during a service attended by diplomatic and local personnel. Five persons, two of them U.S. citizens, were killed and 46 were wounded. The dead Americans were State Department employee Barbara Green and her daughter Kristen Wormsley. Thirteen U.S. citizens were among the wounded. The Lashkar-e-Tayyiba group was suspected.

Car Bomb Explosion in Peru, March 20, 2002: A car bomb exploded at a shopping center near the U.S. Embassy in Lima, Peru. Nine persons were killed and 32

wounded. The dead included two police officers and a teenager. Peruvian authorities suspected either the Shining Path rebels or the Tupac Amaru Revolutionary Movement. The attack occurred 3 days before President George W. Bush visited Peru.

Suicide Bombing in Jerusalem, March 21, 2002: A suicide bombing in Jerusalem killed 3 persons and wounded 86 more, including 2 U.S. citizens. The Palestinian Islamic Jihad claimed responsibility.

Suicide Bombing in Israel, March 27, 2002: A suicide bombing in a noted restaurant in Netanya, Israel, killed 22 persons and wounded 140. One of the dead was a U.S. citizen. The Islamic Resistance Movement (HAMAS) claimed responsibility.

Temple Bombing in Kashmir, March 30, 2002: A bomb explosion at a Hindu temple in Jammu, Kashmir, killed 10 persons. The Islamic Front claimed responsibility.

Suicide Bombing in the West Bank, March 31, 2002: A suicide bombing near an ambulance station in Efrat wounded four persons, including a U.S. citizen. The al-Aqsa Martyrs' Brigades claimed responsibility.

Synagogue Bombing in Tunisia, April 11, 2002: A suicide bomber detonated a truck loaded with propane gas outside a historic synagogue in Djerba, Tunisia. The 16 dead included 11 Germans, one French citizen, and three Tunisians. Twenty-six German tourists were injured. The Islamic Army for the Liberation of the Holy Sites claimed responsibility.

Suicide Bombing in Jerusalem, April 12, 2002: A female suicide bomber killed 6 persons in Jerusalem and wounded 90 others. The al-Aqsa Martyrs' Brigades claimed responsibility.

Car Bombing in Pakistan, May 8, 2002: A car bomb exploded near a Pakistani navy shuttle bus in Karachi, killing 12 persons and wounding 19. Eleven of the dead and 11 of the wounded were French nationals. Al-Qaida was suspected of the attack.

Parade Bombing in Russia, May 9, 2002: A remotely-controlled bomb exploded near a May Day parade in Kaspiisk, Dagestan, killing 42 persons and wounding 150. Fourteen of the dead and 50 of the wounded were soldiers. Islamists linked to al-Qaida were suspected.

Bomb Attacks in Kashmir, May 17, 2002: A bomb explosion near a civil secretariat area in Srinagar, Kashmir, wounded 6 persons. In Jammu, a bomb exploded at a fire services headquarters, killing two and wounding 16. No group claimed responsibility for either attack.

Car Bombing in Pakistan, June 14, 2002: A car bomb exploded near the U.S. Consulate and the Marriott Hotel in Karachi, Pakistan. Eleven persons were killed and 51

were sounded, including one U.S. and one Japanese citizen. Al Qaida and al-Qanin were suspected.

Suicide Bombing in Jerusalem, June 19, 2002: A suicide bombing at a bus stop in Jerusalem killed 6 persons and wounded 43, including 2 U.S. citizens. The al-Aqsa Martyrs' Brigades claimed responsibility.

Suicide Bombing in Tel Aviv, July 17, 2002: Two suicide bombers attacked the old bus station in Tel Aviv, Israel, killing 5 persons and wounding 38. The dead included one Romanian and two Chinese; another Romanian was wounded. The Islamic Jihad claimed responsibility.

Bombing at the Hebrew University, July 31, 2002: A bomb hidden in a bag in the Frank Sinatra International Student Center of Jerusalem's Hebrew University killed 9 persons and wounded 87. The dead included 5 U.S. citizens and 4 Israelis. The wounded included 4 U.S. citizens, 2 Japanese, and 3 South Koreans. The Islamic Resistance Movement (HAMAS) claimed responsibility.

Suicide Bombing in Israel, August 4, 2002: A suicide bomb attack on a bus in Safed, Israel, killed 9 persons and wounded 50. Two of the dead were Philippine citizens; many of the wounded were soldiers returning from leave. HAMAS claimed responsibility.

Attack on a French Tanker, October 6, 2002: An explosive-laden boat rammed the French oil tanker *Limburg*, which was anchored about 5 miles off al-Dhabbah, Yemen. One person was killed and 4 were wounded. Al-Qaida was suspected.

Car Bomb Explosion in Bali, October 12, 2002: A car bomb exploded outside the Sari Club Discotheque in Denpasar, Bali, Indonesia, killing 202 persons and wounding 300 more. Most of the casualties, including 88 of the dead, were Australian tourists. Seven Americans were among the dead. Al-Qaida claimed responsibility. Two suspects were later arrested and convicted. Iman Samudra, who had trained in Afghanistan with al-Qaeda and was suspected of belonging to Jemaah Islamiya, was sentenced to death on September 10, 2003.

Suicide Bombing in Jerusalem, November 21, 2002: A suicide bomb attack on a bus on Mexico Street in Jerusalem killed 11 persons and wounded 50 more. One of the dead was a Romanian. HAMAS claimed responsibility.

Attacks on Israeli Tourists in Kenya, November 28, 2002: A three-person suicide car bomb attack on the Paradise Hotel in Mombasa, Kenya, killed 15 persons and wounded 40. Three of the dead and 18 of the wounded were Israeli tourists; the others were Kenyans. Near Mombasa's airport, two SA-7 shoulder-fired missiles were fired as an Arkia Airlines Boeing 757 that was carrying 261 passengers back to Israel. Both missiles missed. Al-Qaida, the Government of Universal Palestine in Exile, and the Army

of Palestine claimed responsibility for both attacks. Al-Ittihad al-Islami was also suspected of involvement.

Bombing of a Government Building in Chechnya, December 27, 2002: A suicide bomb attack involving two explosives-laden trucks destroyed the offices of the pro-Russian Chechen government in Grozny. The attack killed over 80 people and wounded 210. According to a Chechen website run by the Kavkaz Center, Chechen warlord Shamil Basayev claimed responsibility.

Suicide Bombings in Tel Aviv, January 5, 2003: Two suicide bomb attacks killed 22 and wounded at least 100 persons in Tel Aviv, Israel. Six of the victims were foreign workers. The Al-Aqsa Martyrs' Brigades claimed responsibility.

Night Club Bombing in Colombia, February 7, 2003: A car bomb exploded outside a night club in Bogota, Colombia, killing 32 persons and wounding 160. No group claimed responsibility, but Colombian officials suspected the Colombian Revolutionary Armed Forces (FARC) of committing the worst terrorist attack in the country in a decade.

Suicide Bombing in Haifa, March 5, 2003: A suicide bombing aboard a bus in Haifa, Israel, killed 15 persons and wounded at least 40. One of the dead claimed U.S. as well as Israeli citizenship. The bomber's affiliation was not immediately known.

Suicide Bombing in Netanya, March 30, 2003: A suicide bombing in a cafe in Netanya, Israel, wounded 38 persons. Only the bomber was killed. Islamic Jihad claimed responsibility and called the attack a "gift" to the people of Iraq.

Truck Bomb Attacks in Saudi Arabia, May 12, 2003: Suicide bombers attacked three residential compounds for foreign workers in Riyadh, Saudi Arabia. The 34 dead included 9 attackers, 7 other Saudis, 9 U.S. citizens, and one citizen each from the United Kingdom, Ireland, and the Philippines. Another American died on June 1. It was the first major attack on U.S. targets in Saudi Arabia since the end of the war in Iraq. Saudi authorities arrested 11 al-Qaida suspects on May 28.

Truck Bombing in Chechnya, May 12, 2003: A truck bomb explosion demolished a government compound in Znamenskoye, Chechnya, killing 54 persons. Russian authorities blamed followers of a Saudi-born Islamist named Abu Walid. President Vladimir Putin said that he suspected that there was an al-Qaida connection.

Attempted Assassination in Chechnya, May 12, 2003: Two female suicide bombers attacked Chechen Administrator Mufti Akhmed Kadyrov during a religious festival in Iliskhan Yurt. Kadyrov escaped injury, but 14 other persons were killed and 43 were wounded. Chechen rebel leader Shamil Basayev claimed responsibility.

Suicide Bomb Attacks in Morocco, May 16, 2003: A team of 12 suicide bombers attacked five targets in Casablanca, Morocco, killing 43 persons and wounding

100. The targets were a Spanish restaurant, a Jewish community, a Jewish cemetery, a hotel, and the Belgian Consulate. The Moroccan Government blamed the Islamist al-Assirat al-Moustaquim (The Righteous Path), but foreign commentators suspected an al-Qaida connection.

Suicide Bomb Attack in Jerusalem, May 18, 2003: A suicide bomb attack on a bus in Jerusalem's French Hill district killed 7 persons and wounded 20. The bomber was disguised as a religious Jew. HAMAS claimed responsibility

Suicide Bombing in Afula, May 19, 2003: A suicide bomb attack by a female Palestinian student killed 3 persons and wounded 52 at a shopping mall in Afula, Israel. Both Islamic Jihad and the al-Aqsa Martyrs' Brigades claimed responsibility.

Suicide Bombing in Jerusalem, June 11, 2003: A suicide bombing aboard a bus in Jerusalem killed 16 persons and wounded at least 70, one of whom died later. HAMAS claimed responsibility, calling it revenge for an Israeli helicopter attack on HAMAS leader Abdelaziz al-Rantisi in Gaza City the day before.

Truck Bombing in Northern Ossetia, August 1, 2003: A suicide truck bomb attack destroyed a Russian military hospital in Mozdok, North Ossetia and killed 50 persons. Russian authorities attributed the attack to followers of Chechen rebel leader Shamil Basayev.

Hotel Bombing in Indonesia, August 5, 2003: A car bomb exploded outside the Marriott Hotel in Jakarta, Indonesia, killing 10 persons and wounding 150. One of the dead was a Dutch citizen. The wounded included an American, a Canadian, an Australian, and two Chinese. Indonesian authorities suspected the Jemaah Islamiah, which had carried out the October 12, 2002 bombing in Bali.

Bombing of the Jordanian Embassy in Baghdad, August 7, 2003: A car bomb exploded outside the Jordanian Embassy in Baghdad, Iraq, killing 19 persons and wounding 65. Most of the victims were apparently Iraqis, including 5 police officers. No group claimed responsibility.

Suicide Bombings in Israel and the West Bank, August 12, 2003: The first suicide bombings since the June 29 Israeli-Palestinian truce took place. The first, in a supermarket at Rosh Haayin, Israel, killed one person and wounded 14. The second, at a bus stop near the Ariel settlement in the West Bank, killed one person and wounded 3. The al-Aqsa Martyrs' Brigades claimed responsibility for the first; HAMAS claimed responsibility for the second.

Bombing of the UN Headquarters in Baghdad, August 19, 2003: A truck loaded with surplus Iraqi ordnance exploded outside the United Nations Headquarters in Baghdad's Canal Hotel. A hospital across the street was also heavily damaged. The 23 dead included UN Special Representative Sergio Viera de Mello. More than 100 persons were wounded. It was not clear whether the bomber was a Baath Party loyalist or a

foreign Islamic militant. An al-Qaeda branch called the Brigades of the Martyr Abu Hafz al-Masri later claimed responsibility.

Suicide Bombing in Jerusalem, August 19, 2003: A suicide bombing aboard a bus in Jerusalem killed 20 persons and injured at least 100, one of whom died later. Five of the dead were American citizens. HAMAS and Islamic Jihad claimed responsibility, although HAMAS leader al-Rantisi said that his organization remained committed to the truce while reserving the right to respond to Israeli military actions.

Car Bomb Kills Shi'ite Leader in Najaf, August 29, 2003: A car bomb explosion outside the Shrine of the Imam Ali in Najaf, Iraq killed at least 81 persons and wounded at least 140. The dead included the Ayatollah Mohammed Bakir al-Hakim, one of four leading Shi'ite clerics in Iraq. Al-Hakim had been the leader of the Supreme Council for the Islamic Revolution in Iraq (SCIRI) since its establishment in 1982, and SCIRI had recently agreed to work with the U.S.-sponsored Iraqi Governing Council. It was not known whether the perpetrators were Baath Party loyalists, rival Shi'ites, or foreign Islamists.

Suicide Bombings in Israel, September 9, 2003: Two suicide bombings took place in Israel. The first, at a bus stop near the Tsrifin army base southeast of Tel Aviv, killed 7 soldiers and wounded 14 soldiers and a civilian. The second, at a café in Jerusalem's German Colony neighborhood, killed 6 persons and wounded 40. HAMAS did not claim responsibility until the next day, although a spokesman called the first attack "a response to Israeli aggression."

Suicide Bombing in Israel, October 4, 2003: A Palestinian woman made a suicide bomb attack on a restaurant in Haifa, killing 19 persons and wounding at least 55. Islamic Jihad claimed responsibility for the attack. The next day, Israel bombed a terrorist training camp in Syria.

Attacks in Iraq, October 9, 2003: Gunmen assassinated a Spanish military attaché in Baghdad. A suicide car bomb attack on an Iraqi police station killed 8 persons and wounded 40.

Car Bombings in Baghdad, October 12, 2003: Two suicide car bombs exploded outside the Baghdad Hotel, which housed U.S. officials. Six persons were killed and 32 wounded. Iraqi and U.S. security personnel apparently kept the cars from actually reaching the hotel.

Bomb Attack on U.S. Diplomats in the Gaza Strip, October 15, 2003: A remote-controlled bomb exploded under a car in a U.S. diplomatic convoy passing through the northern Gaza Strip. Three security guards, all employees of DynCorp, were killed. A fourth was wounded. The diplomats were on their way to interview Palestinian candidates for Fulbright scholarships to study in the United States. Palestinian President Arafat and Prime Minister Qurei condemned the attack, while the major Palestinian

militant groups denied responsibility. The next day, Palestinian security forces arrested several suspects, some of whom belonged to the Popular Resistance Committees.

Rocket Attack on the al-Rashid Hotel in Baghdad, October 26, 2003: Iraqis using an improvised rocket launcher bombarded the al-Rashid Hotel in Baghdad, killing one U.S. Army officer and wounding 17 persons. The wounded included 4 U.S. military personnel and seven American civilians. Deputy Secretary of Defense Paul D. Wolfowitz, who was staying at the hotel, was not injured. After visiting the wounded, he said, "They're not going to scare us away; we're not giving up on this job."

Wave of Car Bombings in Baghdad, October 27, 2003: A series of suicide car bombings in Baghdad killed at least 35 persons and wounded at least 230. Four attacks were directed at Iraqi police stations, the fifth and most destructive was directed at the International Committee of the Red Cross headquarters, where at least 12 persons were killed. A sixth attack failed when a car bomb failed to explode and the bomber was wounded and captured by Iraqi police. U.S. and Iraqi officials suspected that foreign terrorists were involved; the unsuccessful bomber said he was a Syrian national and carried a Syrian passport. After a meeting with Administrator L. Paul Bremer, President Bush said, "The more successful we are on the ground, the more these killers will react."

Suicide Bombing in Riyadh, November 8, 2003: In Riyadh, a suicide car bombing took place in the Muhaya residential compound, which was occupied mainly by nationals of other Arab countries. Seventeen persons were killed and 122 were wounded. The latter included 4 Americans. The next day, Deputy Secretary of State Armitage said al-Qaeda was probably responsible.

Truck Bombing in Nasiriyah, November 12, 2003: A suicide truck bomb destroyed the headquarters of the Italian military police in Nasiriyah, Iraq, killing 18 Italians and 11 Iraqis and wounding at least 100 persons.

Synagogue Bombings in Istanbul, November 15, 2003: Two suicide truck bombs exploded outside the Neve Shalom and Beth Israel synagogues in Istanbul, killing 25 persons and wounding at least 300 more. The initial claim of responsibility came from a Turkish militant group, the Great Eastern Islamic Raiders' Front, but Turkish authorities suspected an al-Qaeda connection. The next day, the London-based newspaper *al-Quds al-Arabi* received an e-mail in which an al-Qaeda branch called the Brigades of the Martyr Abu Hafz al-Masri claimed responsibility for the Istanbul synagogue bombings.

Grenade Attacks in Bogota, November 15, 2003: Grenade attacks on two bars frequented by Americans in Bogota killed one person and wounded 72, including 4 Americans. Colombian authorities suspected FARC (the Revolutionary Armed Forces of Colombia). The U.S. Embassy suspected that the attacks had targeted Americans and warned against visiting commercial centers and places of entertainment.

More Suicide Truck Bombings in Istanbul, November 20, 2003: Two more suicide truck bombings devastated the British HSBC Bank and the British Consulate General in Istanbul, killing 27 persons and wounding at least 450. The dead included Consul General Roger Short. U.S., British, and Turkish officials suspected that al-Qaeda had struck again. The U.S. Consulate in Istanbul was closed, and the Embassy in Ankara advised American citizens in Istanbul to stay home.

Car Bombing in Kirkuk, November 20, 2003: A suicide car bombing in Kirkuk killed 5 persons. The target appeared to be the headquarters of the Patriotic Union of Kurdistan. PUK officials suspected the Ansar al-Islam group, which was said to have sheltered fugitive Taliban and al-Qaeda members after the U.S. campaign in Afghanistan.

Train Bombing in Southern Russia, December 5, 2003: A suicide bomb attack killed 42 persons and wounded 150 aboard a Russian commuter train in the south Russian town of Yessentuki. Russian officials suspected Chechen rebels; President Putin said the attack was meant to disrupt legislative elections. Chechen rebel leader Aslan Maskhadov denied any involvement.

Suicide Bombing in Moscow, December 9, 2003: A female suicide bomber killed 5 other persons and wounded 14 outside Moscow's National Hotel. She was said to be looking for the State Duma.

Suicide Car Bombings in Iraq, December 15, 2003: Two days after the capture of Saddam Hussein, there were two suicide car bomb attacks on Iraqi police stations. One at Husainiyah killed 8 persons and wounded 20. The other, at Ameriyah, wounded 7 Iraqi police. Guards repelled a second vehicle.

Office Bombing in Baghdad, December 19, 2003: A bomb destroyed the Baghdad office of the Supreme Council of the Islamic Revolution in Iraq, killing a woman and wounding at least 7 other persons.

Suicide Car Bombing in Irbil, December 24, 2003: A suicide car bomb attack on the Kurdish Interior Ministry in Irbil, Iraq, killed 5 persons and wounded 101.

Attempted Assassination in Rawalpindi, December 25, 2003: Two suicide truck bombers killed 14 persons as President Musharraf's motorcade passed through Rawalpindi, Pakistan. An earlier attempt on December 14 caused no casualties. Pakistani officials suspected Afghan and Kashmiri militants. On January 6, 2004, Pakistani authorities announced the arrest of 6 suspects who were said to be members of Jaish-e-Muhammad.

Suicide Bombing in Israel, December 25, 2003: A Palestinian suicide bomber killed 4 persons at a bus stop near Petah Tikva, Israel. The Popular Front for the Liberation of Palestine claimed responsibility for the attack in retaliation for Israeli military operations in Nablus that had begun two days earlier.

Restaurant Bombing in Baghdad, December 31, 2003: A car bomb explosion outside Baghdad's Nabil Restaurant killed 8 persons and wounded 35. The wounded included 3 *Los Angeles Times* reporters and 3 local employees.

This document, based entirely on public sources, was prepared for background information and reference purposes. It is not intended to be a complete or comprehensive account of all terrorist incidents during these years, and it is not an official expression of U.S. policy. Please email questions or comments to History@State.gov.

LIST OF REFERENCES

- Abdel-Aziz. "The Mujahideen Explosives Handbook." *Organization for the Preparation of Mujahideen*, February 7, 1996. Available at http://www.exet.nu/html/download/ovrigt/mujahideen_explosive_book.pdf [Accessed September 20, 2005].
- Agency for Toxic Substances and Disease Registry. *Public Health Statement for 2,4,6-Trinitrotoluene, CAS# 118-96-7*, June 1995. Available at <http://www.atsdr.cdc.gov/toxprofiles/phs81.html> [Accessed Sept 18, 2005].
- Ansari, Massod. "JTIC Exclusive: A Bomber's A-Z – Notes From Pakistani Terrorist Training Manuals." Jane's Terrorism and Insurgency Centre, 16 June 2004.
- Barros, Sam. "Fulminate Explosives Synthesis." Available at <http://www.powerlabs.org/chemlabs/fulminate.htm> [Accessed September 15, 2005].
- Bowman, Steve and Helit Barel. "Weapons of Mass Destruction – the Terrorist Threat." *CRS Report for Congress*, December 8, 1999.
- Castle, Mike M. "Draino Bomb," from mlcastle.net (last updated March 7, 2005). Available at <http://mlcastle.net/raisethefist/draino.html> [Accessed June 21, 2004].
- Doyle, Charles. "Bomb-Making Online: An Abridged Sketch of Federal Criminal Law." *Library of Congress: Congressional Research Service* (CRS Order Code RS 21616), Sept 10, 2003.
- Fiorill, Joe. "Panel Seeks Broad Terrorism Information-Sharing Changes." *Daily Briefing*. December 13, 2004.
- Hughart, Joseph L and Mark M Bashor. "Industrial Chemicals and Terrorism: Human Health Threat Analysis, Mitigation and Prevention." *US Department of Health and Human Services, Agency for Toxic Substances and Disease Registry*, last updated 4/6/1999. Available at <http://www.mipt.org/pdf/industrialchemicalsandterrorism.pdf> [Accessed Sept 15, 2005].
- Joint Publication 1-02. *Department of Defense Dictionary of Military and Associated Terms*. 12 April 01 (as amended through 3 August 2005).
- National Memorial Institute for the Prevention of Terrorism. "Terrorist Incident Reports, Incidents by Tactic." *MIPT Terrorism Knowledge Database*. Available at <http://www.tkb.org/IncidentTacticModule.jsp> [Accessed August 25, 2005].
- National Memorial Institute for the Prevention of Terrorism. "Terrorism Incidents & Significant Dates." Available at <http://www.mipt.org/incidentcalendar.asp> [Accessed Sept 18, 2005].
- Nedved, M. "Explosion Prevention and Control." *Occupational Health* 32:7 (1980), 358-362.
- Nemati, Hamid R. and Christopher D. Barko. *Organizational Data Mining: Leveraging Enterprise Data Resources for Optimal Performance*. Hershey, PA: Idea Group Publishing, 2004.
- Oklahoma City National Memorial website. Available at <http://www.oklahomacitynationalmemorial.org/> [Accessed Sept 18, 2005].
- Strohm, Chris. "Tenet Warns of Terrorists Combining Physical, Telecommunications Attacks." *Daily Briefing*. December 1, 2004.

- The Columbia Electronic Encyclopedia, 6th ed., 2005. Available at <http://columbia.thefreedictionary.com/2,4,6-trinitrotoluene> [Accessed Sept 15, 2005].
- U.S. Department of Homeland Security, Office for Domestic Preparedness. "Explosive Devices," *Awareness Level WMD Training* (n.d.). http://cdp.dhs.gov/pdfs/agert/Explosive_Devices.pdf [Accessed September 19, 2005].
- U.S. Department of Justice. "Bomb Summary." Washington, D.C.: FBI Bomb Data Center, 1990.
- U.S. Department of the Treasury. *Progress Report Study of Marking, Rendering Inert, and Licensing of Explosives Materials*. Washington, D.C., 1997.
- US Bureau of Alcohol, Tobacco and Firearms (BATF). "Statistics 1990-1998." Washington, DC, 1998.
- US Bureau of Alcohol, Tobacco and Firearms. *Be Secure for America*. Available at (<http://www.atf.gov/pub/threat/secure2.htm>) [Accessed June 23, 2004].
- US Department of Defense. *Department of Defense Dictionary of Military Terms* (As amended through 31 August 2005). Available at <http://www.dtic.mil/doctrine/jel/doddict/> [Accessed Sept 19, 2005].
- US Department of State Bureau of Public Affairs, Office of the Historian. "Significant Terrorist Incidents, 1961-2003: A Brief Chronology," Historical Background, March 2004. Available at <http://www.state.gov/r/pa/ho/pubs/fs/5902.htm> [Accessed Sept 19, 2005].
- US Department of State Bureau of Public Affairs. "Chronology of Significant Terrorist Incidents, Patterns of Global Terrorism: 1998." (n.d.). Available at <http://www.state.gov/www/global/terrorism/1998Report/appa.html>, [Accessed June 21, 2004].
- US Department of State Bureau of Public Affairs. "Chronology of Significant Terrorist Incidents, Patterns of Global Terrorism: 2000." April 2001. Available at <http://library.nps.navy.mil/home/tgp/chrono2000.htm>, [Accessed Sept 19, 2005].
- US Department of the Treasury, Bureau of Tobacco, Alcohol and Firearms. "Commerce in Explosives; lists of explosive materials, Commerce in Explosives," Update 4/26/02. Available at http://www.atf.treas.gov/pub/fire-explo_pub/listofexp.htm [Accessed April 23, 2004].

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, Virginia
2. Dudley Knox Library
Naval Postgraduate School
Monterey, California
3. Paul Stockton, Director
Center for Homeland Defense and Security
Naval Postgraduate School
Monterey, California
4. Ted Lewis, Academic Associate
Center for Homeland Defense and Security
Naval Postgraduate School
Monterey, California
5. Prof. Rudy Darken
Center for Homeland Defense and Security
Naval Postgraduate School
Monterey, California
6. David O’Keeffe, Chief Operations Officer
Center for Homeland Defense and Security
Naval Postgraduate School
Monterey, California
7. Chris Bellavita, Director of Programs
Center for Homeland Defense and Security
Salt Lake City, Utah
8. Bill Kelley
Office for Domestic Preparedness
Department of Homeland Security
Washington, D.C.